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Paper

Supplemental Material

For: "Understanding linguistic evolution using an event-based model"

Anonymous submission

1. Methods

We describe the assumptions of the models, how their parameters are estimated, and how different models of segmental evolution can be compared in a statistical framework.

1.1. Phylogeny relating languages

We assume that the languages in our study group are related by an unknown evolutionary tree, called a 'Phylogeny', which we denote Ψ. The phylogeny contains information on the topological relationships among N sampled languages, as well as the divergence times of the languages or the amount of change that occurred between the languages.

Figure 1 shows an example of a phylogeny for $N = 9$ languages. In the terminology of evolutionary biology, the tree is composed of 'nodes' and 'branches.' (By contrast, mathematicians call nodes and branches 'vertices' and 'edges,' respectively.) The nodes represent the tips of the tree, each of which is assigned a language, and the points on the tree where languages diverge. Each tip is labeled $1, 2, \ldots, N$. The interior nodes are labeled $N + 1, N + 2, \ldots, 2N - 1$ in preorder sequence (i.e., ordered sequentially from the tips to the root). The root node is always assigned the label $2N - 1$. We denote the ancestor of node i as $\sigma(i)$. In the tree of Figure 1, the ancestor of node 3 is $\sigma(3) = 13$.

The branches connect the nodes of the tree and are represented as lines in Figure 1. The branch is assigned the label from its descendant node. In Figure 1, for instance, the branch connecting nodes 13 and 14 is labeled 15.

A phylogeny is an information-rich graph. For one, it contains information on the relationships of the languages. This topological information is denoted τ. Figure 1 for example, suggests that French and Walloon are each others' closest relatives. They are more closely related to each other than they are to any another language on the tree because they share a more recent common ancestor that is not shared with any other languages. This common ancestor is the node numbered 12 in Figure 1. There are many possible ways in which the languages in our study group can be related to one another, with the tree of Figure 1 depicting only one of the possibilities. In fact, for the case in which $N = 9$

languages are considered, there are 2027025 possible trees relating the languages. In general, the number of possible rooted trees is the product of the odd numbers up to, and including, $2N-3$: $\mathbf{B}(N) = (2N-3)!! = 1 \times 3 \times \ldots \times 2N-3$. Each topology is given a unique label, $\tau_1, \tau_2, \ldots, \tau_{\mathbf{B}(N)}$. The number of possible tree topologies becomes quite large very quickly. Given $N = 60$ languages, for example, there are 5.86×10^{96} possible topologies, each depicting a unique and different way the languages can be related. For comparison, the number of atoms in the universe is on the order of 10^{80}.

The interior nodes of the tree represent language divergence events that occurred at specific times in the past and are denoted $\boldsymbol{t} = (t_{N+1}, t_{N+2}, \ldots, t_{2N-1})$. The tip nodes are all assigned the time $t = 0$. We discuss in more detail below a stochastic model of language change. However, the model we use, along with every other stochastic model for phylogenies, has an all-important parameter that describes the rate at which the language changes. This parameter is called the substitution rate and denoted μ. Without external information to constrain the divergence times, such as one language divergence time that is considered known, it is impossible to estimate divergence times. The problem is that one obtains the same net divergence between two languages from a high rate of language evolution and a short divergence time separating the languages, or a low rate of language evolution and a long time separating the languages. In fact, the expected number of evolutionary events that occurred between two languages that diverged at time t is $\nu = 2t\mu$. (The factor of two is introduced because the path between the two languages is the time from one language to the common ancestor, and then back up the tree to the other language.) In this paper, we allow each of the $2N-2$ branches of the tree to have an independent substitution rate. The expected number of evolutionary events on the ith branch of the tree is $\nu = (t_{\sigma_i} - t_i) \times \mu_i$. In this study, we do not estimate the divergence times on the tree, but rather the compound parameter representing the branch lengths ν_i, which are in units of expected number of substitutions per segment (as described below).

1.2. Data

The similarities of words from different languages are informative about how the languages are related. In this study, we use statistical methods developed in the field of evolutionary biology to estimate the relationships of species based on either the morphological characteristics of the species or the DNA sequences sampled from the same gene and compared across the species. The methods assume that the characteristics compared across species are homologous. Homology, in evolutionary biology, is similarity in some characteristic that is caused by common ancestry. Consider as an

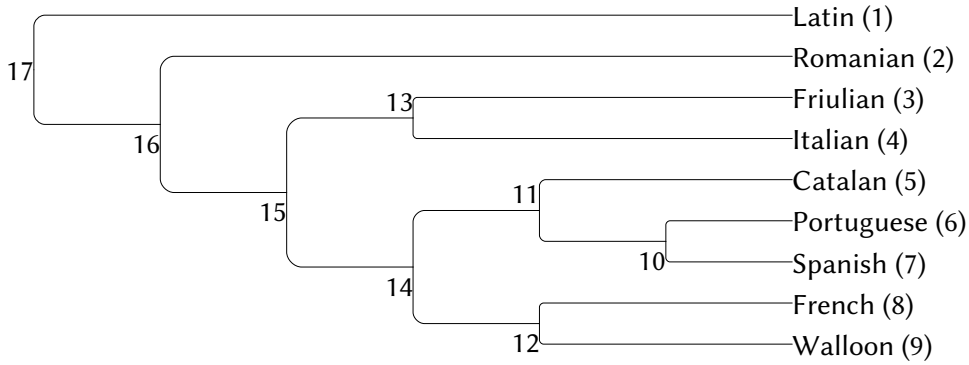

Fig 1. An example tree showing the relationships of $N = 9$ languages.

example the following DNA sequences sampled from three species,

Chimpanzee	`AAGCTTCACCGGCGCAATTATCCTCATAATCGCCCACGGACTTACATCCT...`
Gorilla	`AAGCTTCACCGGCGCAGTTGTTCTTATAATTGCCCACGGACTTACATCAT...`
Human	`AAGCTTCACCGGCGCAGTCATTCTCATAATCGCCCACGGGCTTACATCCT...`

These are partial mitochondrial sequences from Gojobori (Hayasaka et al. 1988). In the original paper, the complete data had $N = 12$ primate species and the sequences were each 898 nucleotides in length. In a phylogenetic analysis of DNA sequenes, homology is assumed at two levels. First, one assumes that the sequences that are compared are homologous. Typically, homology at this level is established by sequence similarity and synteny of the gene (i.e., the gene that is compared across species is in the same, or at least similar, position along the chromosome when compared across species, which is another way of saying the gene that is compared has the same neighboring genes in all the species in the analysis).

Not only must the DNA sequences be homologous, but the fine-scale homology of the sequences must also be established. The DNA sequences above are in an aligned form in which the fine-scale

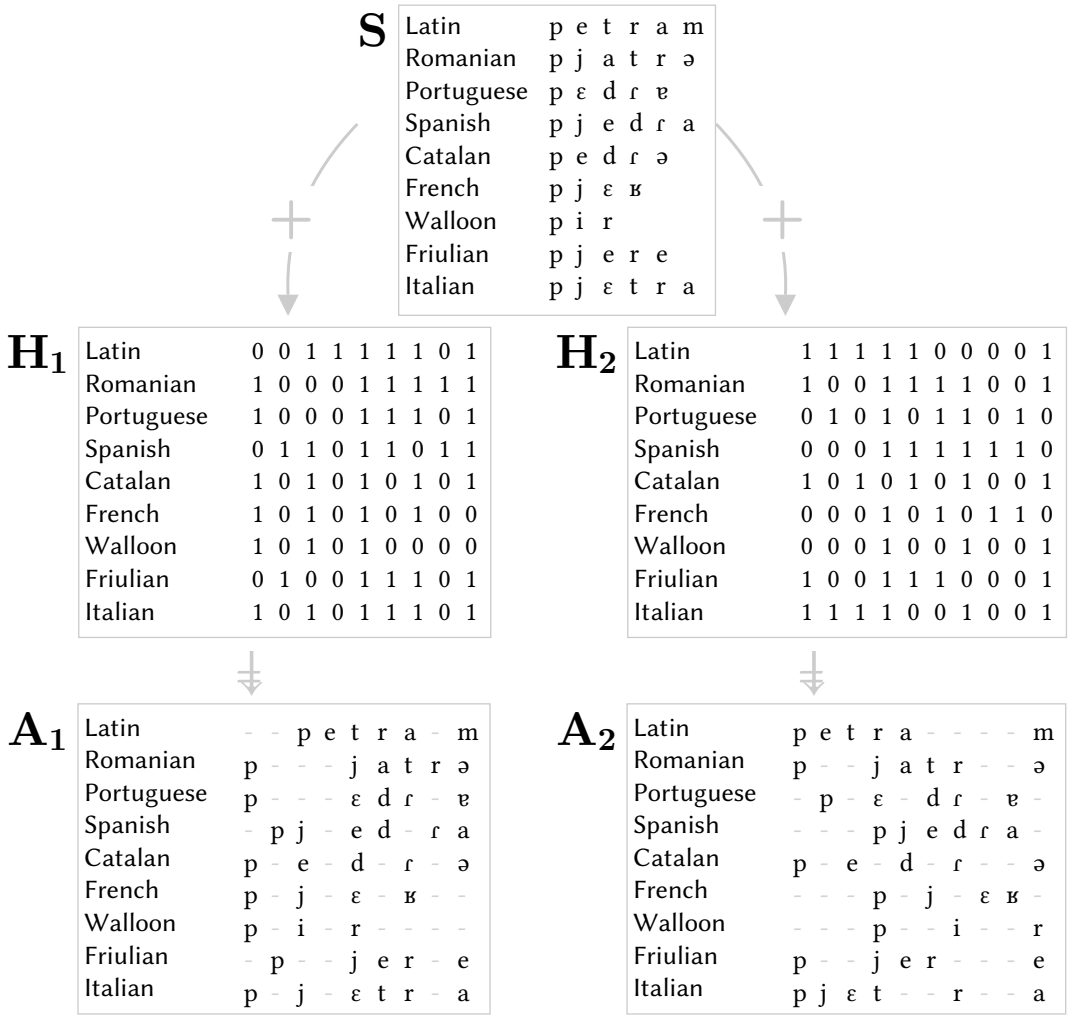

Fig 2. Alignments (**A**) are formed from the observed segments (**S**) and a homology map (**H**).

homology has been established; each column of the alignment is considered to be homologous. So, for example, the first column of the alignment which happens to be the nucleotide A in all three species is assumed to be homologous. It is assumed that the common ancestor of gorillas, chimpanzees, and humans had the same gene, which also had a position that was homologous to the first column in the alignment. Fine-scale homology is established using computer programs in a process called ‘ alignment.’ Importantly, phylogenetic methods assume that the homology established by the alignment program is correct.

Our approach to the underyling data for phylogenetic inference is novel within linguistics. Like others, we concentrate on the so-called ‘basic vocabulary’ of a language (Swadesh 1952; Chang et al. 2015; Greenhill et al. 2021; Auderset et al. 2023; Heggarty et al. 2023), since the lexical items that instantiate concepts in this domain are less prone to horizontal transmission (i.e., linguistic borrowing). In contrast to every study of linguistic phylogenetics that we are aware of, however, our investigation draws inferences directly from word-forms. For each concept in our dataset, homologous lexical items are assigned to a *cognate class*. The word-forms within each cognate class are phonemic representations based on the International Phonetic Alphabet (International Phonetic Association 1999). Consider the cognate class for the concept ‘stone’:

Latin	p	-	e	t	r	a	m
Romanian	p	j	a	t	r	ə	-
Portuguese	p	-	ɛ	d	ɾ	ɐ	-
Spanish	p	j	e	d	ɾ	a	-
Catalan	p	-	e	d	ɾ	ə	-
French	p	j	ɛ	-	ʁ	-	-
Walloon	p	-	i	-	r	-	-
Friulian	p	j	e	-	r	e	-
Italian	p	j	ɛ	t	r	a	-

The word for ‘stone’ in Latin, for example, is /petram/. The matrix assumes that the fine-scale homology of the segments has been established. For example, it assumes that the glide /j/ of Romanian, Spanish, French, Friulian, and Italian are homologous. The dashes indicate that there is no homologous segment at that potential position in the word. As discussed in more detail below, this is

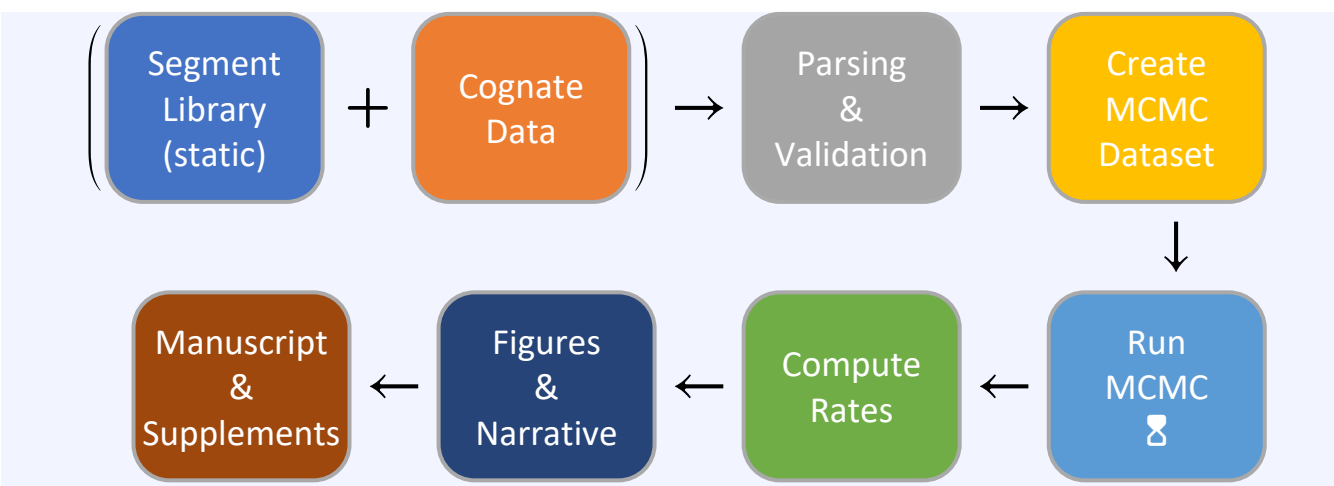

Fig 3. The workflow of the experiment.

not the only possible alignment and Figure 2 shows two further possibilities.

Note that a segmental alignment, denoted $\mathbf{A}$, is constructed by combining the segmental information for the languages of interest with information on the homology of the segments. The segmental information for the N languages of interest is denoted $\mathbf{S} = (\mathbf{s}_1, \mathbf{s}_2, \ldots, \mathbf{s}_N)$, where $\mathbf{s}_i$ is the segmental string for the ith language. The segmental information for the $N = 9$ languages for the cognate class above for 'stone' is:

Latin	p	e	t	r	a	m
Romanian	p	j	a	t	r	ə
Portuguese	p	ɛ	d	ɾ	ɐ	
Spanish	p	j	e	d	ɾ	a
Catalan	p	e	d	ɾ	ə	
French	p	j	ɛ	ʁ		
Walloon	p	i	r			
Friulian	p	j	e	r	e	
Italian	p	j	ɛ	t	r	a

Here, the segments for Latin would be $\mathbf{s}_1 = (\mathrm{petram})$. The alignment of the segments is accomplished by the use of a map, $\mathbf{H}$, describing the homology of the segments. The alignment is formed by combining the segment information with the homology map, $\mathbf{A} = (\mathbf{S}, \mathbf{H})$. Figure 2 shows an example of two alignments for the word stone that can be formed using two different homology maps.

Spoken and written word-forms can be observed, but alignments cannot. There are many different ways in which the segments of a cognate word can be homologous. The example from the word stone, above, shows only one such way. In this study, we develop the statistical and analytical machinery that allow us to marginalize over the segmental alignments. Our method considers all possible segmental alignments of the word-forms in a cognate class, weighting each such possibility by its probability under a model. In this way, our method does not condition on any specific segmental alignment.

1.3. Language evolution model

We assume that cognate words evolve along the branches of a phylogenetic tree through substitution of one segment by another, insertion of a new segment, or deletion of a segment.

Substitution of one segment for another is modeled using a continuous-time Markov model in which the possible states are the set of segments in the phonemic representations. At the heart of a continuous-time Markov chain is a rate matrix describing the rate of change between all pairs of states. Consider, for example, a simplified Markov process with only five segments as states. The rates of change between the pairs of states can be represented in tabular form as follows:

		To				
		A	B	C	D	E
	A	q_{AA}	q_{AB}	q_{AC}	q_{AD}	q_{AE}
	B	q_{BA}	q_{BB}	q_{BC}	q_{BD}	q_{BE}
From	C	q_{CA}	q_{CB}	q_{CC}	q_{CD}	q_{CE}
	D	q_{DA}	q_{DB}	q_{DC}	q_{DD}	q_{DE}
	E	q_{EA}	q_{EB}	q_{EC}	q_{ED}	q_{EE}

where $q_{ij} \geq 0 \ (i \neq j)$ is the rate of change from segment i to segment j. The diagonal elements of the rate matrix q_{ii} are specified such that each row sums to zero (i.e., $q_{ii} = -\sum_{j \neq i} q_{ij}$). This negative value can be interpreted as the rate at which the process moves away from state i. Rates of change between all pairs of states are typically represented in matrix form as follows:

$$\mathbf{Q} = \{q_{ij}\} = \begin{pmatrix} q_{AA} & q_{AB} & q_{AC} & q_{AD} & q_{AE} \\ q_{BA} & q_{BB} & q_{BC} & q_{BD} & q_{BE} \\ q_{CA} & q_{CB} & q_{CC} & q_{CD} & q_{CE} \\ q_{DA} & q_{DB} & q_{DC} & q_{DD} & q_{DE} \\ q_{EA} & q_{EB} & q_{EC} & q_{ED} & q_{EE} \end{pmatrix} \beta \tag{1}$$

The additional parameter β scales the rate matrix such that the average rate of segmental substitution is 1.0.

A continuous-time Markov model has a simple physical interpretation. Specifically, when the process is in state i, one waits an exponentially-distributed time with parameter $-q_{ii}$ until the next segmental substitution occurs. When a change occurs, it is to state j with probability $-q_{ij}/q_{ii}$. Several important quantities can be calculated using the information contained in the rate matrix $\mathbf{Q}$. For one, the probability of the process ending in state j conditional on starting in state i after a period ν can be calculated through exponentiation of the rate matrix, $\mathbf{P}(\nu) = e^{\mathbf{Q}\nu}$. In addition, the equilibrium distribution of the process can be calculated. This distribution is denoted π and represents the probability of capturing the process in a particular state after a very long time (technically, an infinite amount of time) has passed. The equilibrium distribution is calculated by solving the system of equations defined by $\pi\mathbf{Q} = \mathbf{0}$. Both the transition probabilities and equilibrium probability distribution play an important role in calculating the likelihood (see below).

Insertions and deletions of single segments occur at rates λ and μ, respectively. Consider the long-term behavior of a process in which $\lambda > \mu$. On average, segments would be inserted more frequently than they would be deleted, as a result of which the length of word-forms would increase without bounds. The opposite situation occurs when $\lambda < \mu$, as segments are deleted at a higher rate than they are inserted. In this case, the words of a language would be reduced to silence.

The TKF91 (Thorne et al. 1991) model of DNA sequence evolution allows single nucleotides to be inserted and deleted at rates λ and μ. They introduced a convention for thinking about a DNA sequence in which nucleotides are connected by invisible links. Each nucleotide is paired with the link to its right. The left-most nucleotide has a special link to its left, which is known as the immortal link. When a nucleotide is inserted, it is inserted to the right of a link and contributes its own link to its right. Deletions remove a nucleotide and its associated link, but the immortal link is never deleted. As

a result, the process does not go extinct, even when $\lambda < \mu$. Instead, a nucleotide (and its link) can be inserted to to the right of the immortal link.

The TKF91 model constrains the insertion rate to be less than the deletion rate ($\lambda < \mu$), so the equilibrium distribution of a sequence length is geometrically distributed with parameter λ/μ. This constraint is adopted in this study. In fact, the model we use is precisely the same as the TKF91 model, but with a different continuous-time Markov model to describe segmental transitions. TKF91 (Thorne et al. 1991) uses a four-state process to describe nucleotide substitutions.

The overall substitution and insertion/deletion process can be described as follows. In a sequence L segments in length, of which L_i are of segment type i, the time until the next event occurs follows an exponential distribution with parameter

$$r = -\sum_i (L_i q_{ii}) + L\lambda + (L-1)\mu \tag{2}$$

When an event occurs, it is a substitution with probability $-\sum_i (L_i q_{ii})/r$, an insertion with probability $L\lambda/r$, and a deletion with probability $(L-1)\mu/r$. Crucially, the process allows the alignment map ($\mathbf{H}$) to be treated as a parameter of the model.

1.4. Bayesian estimation of model parameters

We estimate the parameters of the model in a Bayesian framework. Bayesians base inferences on the posterior probability distribution of a parameter, which can be calculated using Bayes' theorem as:

$$P(\text{Parameter(s)} \mid \text{Observations}) = \frac{P(\text{Observations} \mid \text{Parameter(s)})\ P(\text{Parameter(s)})}{P(\text{Observations})} \tag{3}$$

where the pipe indicates a conditional statement. In words, the posterior probability distribution of the parameters is equal to the likelihood [$P(\text{Parameter(s)} \mid \text{Observations})$] times the prior probability distribution [$P(\text{Parameter(s)})$], divided by the marginal likelihood [$P(\text{Observations})$].

In this study, parameters include:

$\tau_1, \ldots, \tau_{\mathbf{B}(N)}$	Tree Topologies
$\nu_1, \ldots, \nu_{\mathbf{B}(N)}$	Branch length parameters
θ	Parameters associated with the rate matrix $\mathbf{Q}$
$\lambda, \mu\ (\lambda < \mu)$	The insertion and deletion rates of segments
$\mathbf{H}$	The map describing the alignment of the segments

We assign prior probability distributions to all parameters of the model (see Table 1). The posterior probability distribution of the model parameters is then

$$P(\tau, \nu, \theta, \lambda, \mu | \mathbf{S}) = \frac{P(\mathbf{S}|\tau, \nu, \theta, \lambda, \mu)\ P(\tau, \nu, \theta, \lambda, \mu)}{P(\mathbf{S})} \tag{4}$$

We highlight that the likelihood is marginalized over all possible alignments:

$$P(\mathbf{S}|\tau,\ \nu,\ \theta,\ \lambda,\ \mu) = \sum_{\mathbf{H}} P(\mathbf{S}|\tau,\ \nu,\ \theta,\ \lambda,\ \mu,\ \mathbf{H})\ P(\mathbf{H}) \tag{5}$$

where the sum is over all possible alignment maps. Our inferences are therefore not conditioned on any particular alignment of segments being correct. In a similar vein, the marginal likelihood accounts for all possible combinations of model parameters:

$$P(\mathbf{S}) = \sum_{\tau} \int_{\nu} \int_{\theta} \int_{\lambda<\mu} P(\mathbf{S}|\tau,\ \nu,\ \theta,\ \lambda,\ \mu)\ P(\tau,\ \nu,\ \theta,\ \lambda,\ \mu)\ d\nu\ d\theta\ d\lambda\ d\mu \tag{6}$$

where the integrals represent integration over all possible combinations of branch lengths, rate matrix parameters, and insertion/deletion rates.

The likelihood is calculated on a per-word basis using the algorithm described by (Lunter et al. 2003), which conditions on an alignment. Although the posterior probability distribution can be written down and individual components such as the prior probability or likelihood for a particular combination of parameters can be calculated, analytically solving the high dimensional summations and integrals required for the posterior probability is unfeasible. Instead, we numerically approximate the joint posterior probability distribution of the parameters using Markov chain Monte Carlo.

1.5. Markov chain Monte Carlo

The aim of Markov chain Monte Carlo (MCMC) is to construct a Markov chain that has as its possible states the parameter values of the statistical model and a stationary distribution that is the posterior probability distribution of the parameters. Metropolis et al. (1953) (Metropolis et al. 1953) and Hastings (1970) (Hastings 1970) describe rules for constructing such a chain. When at stationarity, samples from this chain form valid, albeit dependent, samples from the posterior probability distribution. The Metropolis-Hastings algorithm constructs the Markov chain using the following algorithm:

1. The current state of the chain is denoted θ. If this is the first cycle of the Markov chain, initialize θ (e.g., by choosing a value from the prior distribution).
2. Propose a new value for θ, denoted θ'. The proposal mechanism is up to the programmer, but must involve the generation of random numbers u such that the proposed value is a function of the current value and the random numbers, $\theta' = \mathrm{h}(\theta,\ u)$. The probability of proposing the new value is $q(\theta \to \theta)$ whereas the probability of the imagined reverse move, not actually made in computer memory, is $q(\theta' \to \theta)$.
3. Calculate the probability of accepting the proposed value:
   $R = min\left(1, \frac{f(\theta'|\mathbf{X})}{f(\theta|\mathbf{X})} \times \frac{f(\theta')}{f(\theta)} \times \frac{q(\theta' \to \theta)}{q(\theta \to \theta')}\right)$
   In other words, the acceptance probability is the product of the likelihood, prior, and proposal ratios.
4. Generate a uniform(0,1) random variable, u. If $u < R$, accept the proposed state, setting $\theta = \theta'$. Otherwise, the proposed state is said to be rejected and the chain remains in state θ.
5. Return to Step # 1.

The proposals we implement in this study are all typical for phylogenetic models, such as the LOCAL mechanism to update the tree and branch lengths (Larget et al. 1999). The unique aspect of this study is a proposal mechanism for the alignments of the segments for various words. Here, we use

the proposal mechanism described by Lunter et al. (Lunter et al. 2005).

The general strategy behind a MCMC analysis is to run the chain for many thousands or millions of cycles. Each cycle, the chain proposes a new state that may accepted or rejected as the next state of the chain. Every so often, the state of the chain is printed to a file. In our study, we sampled the chain every 100 cycles. The samples contained in the output files can be used to reconstruct the marginal posterior probability distributions of parameters. As an example, the fraction of the time a particular alignment of a cognate is found in the file is a valid approximation of that alignment's posterior probability. Similarly, the fraction of the time a particular tree topology is found in the output file is a valid approximation of that tree's posterior probability. Probability distributions for continuous parameters can be approximated by constructing a frequency histogram for the parameter from the output files produced by the MCMC analysis.

1.6. Model comparison

In a Bayesian analysis, parameter estimates are based on the joint posterior probability distribution of the parameters, which we numerically approximate using the Metropolis-Hastings algorithm. Often, however, the linguist is interested in the comparison of two or more models with the goal of evaluating which of the models best explains the observations. Bayesian model comparison is based on the marginal likelihoods of the models. Consider two different linguistics models, M_1 and M_2 with marginal likelihoods, $P(\mathbf{S}|M_1)$ and $P(\mathbf{S}|M_2)$ (note the marginal likelihoods are calculated for the same observations). The ratio of the marginal likelihoods is known as the Bayes Factor:

$$BF_{12} = \frac{P(\mathbf{S}|M_1)}{P(\mathbf{S}|M_2)} \tag{7}$$

The Bayes Factor measures the relative support of the two models. A Bayes Factor less than one favors M_1, whereas the oppose is true for a Bayes factor greater than one. In contrast to frequentist statistics, Bayesian model comparison does not involve p-values. The Bayes Factor is instead interpreted as is or on a log scale. (Jeffreys 1961) devised the following categories to interpret Bayes Factors:

BF	$\log_{10} BF$	Interpretation
$1 - 3.2$	$0 - 0.5$	Not worth a bare mention
$3.2 - 10$	$0.5 - 1$	Substantial
$10 - 100$	$1 - 2$	Strong
> 100	> 2	Decisive

In a Bayesian analysis, there is no need to penalize parameter rich models for having more parameters. Rather, the penalization is built into the comparison; the additional parameters in a complicated model are each assigned a prior probability distribution. A parameter-rich model has lower prior probability for any combination of model parameters than a simpler model. Hence, there is no need to compare the Bayes factor to a null distribution as there is in frequentist hypothesis testing.

The main limitation of Bayesian model comparison is numerically approximating the marginal likelihoods of the models. This can be done in numerous ways. For example, one can construct a Markov chain that jumps between models, even if the models differ in dimensions, using a generalization of MCMC described by Green (1995; reversible-jump MCMC). Alternatively, one can

numerically approximate the marginal likelihoods using what is called path-sampling in which numerous MCMC chains explore a path between the prior and posterior distributions (Lartillot et al. 2006; Xie et al. 2010).

Three models describing how word segments evolve along the branches of the tree are compared in this study. The first model is isomorphic to the model of molecular evolution first described by Jukes and Cantor (Jukes et al. 1969), and assumes that the rates of change between all IPA segments is equal. The second model, isomorphic to the model first described by Felsenstein (Felsenstein 1981), assumes that the rate of change to a state is proportional to its stationary frequency. The third model, our Natural Class Model, partitions the IPA segments into 10 sets according to their articulatory properties. The model allows there to be independently-estimated rates of change for changes to a segment in the same class and also independently-estimated rates for changes between classes.

1.7. Cognates Used in the Paper

In total, the dataset contains 102 cognate sets that comprise 918 word-forms containing 79 unique segments drawn from the following 98 concepts: all, and, at, belly, black, blood, bone, dog, dry, ear, earth, egg, eye, feather, fingernail, fire, five, flower, foot, four, fruit, full, good, grass, green, head, I, if, in, knee, leaf, liver, long, louse, meat, moon, mountain, mouth, narrow, near, new, night, not, old, one, other, rain, red, river, round, salt, sea, seed, skin, sky, star, stone, tail, there, thick, thin, three, come, cut, drink, fall, fight, flow, hear, hold, know, laugh, lieasinabed, play, say, see, sew, sing, sleep, smell, squeeze, stand, swell, think, turn, wash, tongue, tooth, tree, warm, water, what, when, wind, woman, year, you (pl.), and you (sg.).

1.8. Workflow

The first step in the experiment was to create a dictionary of IPA segment information. The files `IPA.nytril` and `Segments.nytril` contain the definitions of these classes and the information about each segment is encoded in separate instances of the these classes. The definition of a segment includes the IPA symbol string {e.g. /ŋ/) and a variety of flags and properties indicating the vocal attributes of the segment (e.g. Vowel, Sibilant, Fricative, etc...) These files are designed to be reusable for future experiments, and by other researchers.

Next is the aggregation of cognate words, stored in nytril source files as strings, organized by category and language. The strings contain UCS code points encoding the IPA symbol for each segment, making it easy to copy and paste from different sources. The dashes between the IPA characters serve to align the positions of the segments vertically, providing the initial alignment for the experiment. The words also may contain syllable stress marks, but these are ignored for this experiment. The format of this file was created to facilitate the collection and editing by the researchers. Although these word files are organized by parts of speech (e.g. `Nouns.nytril`, `Adjectives.nytril`, etc..), this has no effect other than to break them up into smaller chunks for easier editing. In other words, it is organized in the way that makes the most sense to a linguist, but when processed, they are aggregated and sorted in a different way.

The next step involves software. The strings are decoded and the UCS code points are turned into an array of VocalSegment objects. Since the IPA characters contain diacritic marks and have a variable length, the code points in the strings must be normalized to a specific form before being compared. We chose Form C (NFC - Canonical precomposition), but the goal is that the diacritics are in the same relative position in all strings, for accurate comparison. Once these strings are parsed to object

pointers, they are tested by converting them back to a string to confirm that they produce the same sequence as the starting point. The segment objects are next grouped into words, and associated by category, cognate and language until the final result is a large conventional data structure representing all of the raw data in the experiment.

The next step is to produce a series of diagnostic documents that show the data in a variety of tables and charts. The goal is to slice the words and data in different ways to allow the researcher to spot any mistakes in alignments or composition.

When the team is statisfied that the data is well formed, a process is run to take all of the data and create an experiment snapshot. This builds a folder full of various files in nytril and JSON format, that are read by the TongueTwister program.

TongueTwister performs the MCMC calculations (that run for several days) and produce a large series of tree files and other data. After this is complete, these files are read by another program called TongueTwisterReader that does the final statistical aggregation and produces final output files in the nytril format.

Finally, these files are read by a program written in nytril that takes the final output files and produces a series of tables, charts and figures. These figures are combined with narrative from the researchers, to produce the final paper and presentation slide decks. Figure 3 shows a model of this workflow.

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Figures

Figure 1. Example Tree 2
Figure 2. Alignment 3
Figure 3. Workflow 4

Appendix 1: Alignment categories

All cognate categories showing the number of alignments to reach the 95% credible interval.

At 2	And 9	And 10	In 10	YouSingular 11
If 14	Salt 18	All 182	Belly 218	Black 198
Blood 477	Bone 263	Dog 58	Dry 88	Ear 533
Earth 211	Egg 685	Eye 365	Feather 107	Fingernail 141
Fire 217	Five 242	Flower 33	Foot 734	Four 330
Fruit 601	Full 339	Good 340	Grass 204	Green 144
Head 77	I 169	Knee 1087	Leaf 804	Liver 642
Long 114	Long 120	Louse 777	Meat 55	Moon 37
Mountain 58	Mouth 141	Narrow 1022	Near 498	New 757
Night 334	Not 22	Old 1519	One 38	Other 65
Rain 958	Red 114	River 101	Round 860	Sea 25
Seed 158	Seed 358	Skin 285	Sky 226	Star 472
Stone 302	Tail 106	There 52	Thick 148	Thin 92
Three 148	ToCome 149	ToCut 484	ToDrink 1023	ToFall 425
ToFight 531	ToFlow 427	ToHear 90	ToHold 195	ToKnow 1090
ToLaugh 534	ToLieAsInABed 723	ToPlay 254	ToSay 700	ToSee 751
ToSew 387	ToSing 191	ToSleep 148	ToSmell 146	ToSqueeze 1016
ToStand 152	ToSwell 1158	ToSwell 347	ToThink 153	ToTurnIntransitive 112
ToWash 174	Tongue 479	Tooth 52	Tree 187	Warm 73
Water 542	What 50	When 178	Wind 207	Woman 149
Year 98	YouPlural 142			

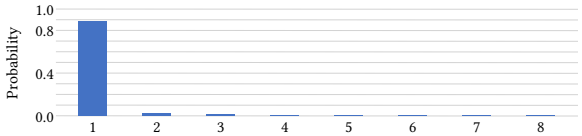
Appendix 2: All Alignments

95% credible set of alignments for each category.

At

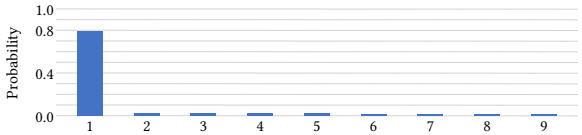
	0.937		0.0128 (0.950)		
Latin	a	d	a	-	d
Romanian	a	-	a	-	-
Portuguese	ɐ	-	-	ɐ	-
Spanish	a	-	a	-	-
Catalan	a	-	a	-	-
French	a	-	a	-	-
Walloon	a	-	a	-	-
Friulian	a	-	a	-	-
Italian	a	-	a	-	-

And



	0.884			0.0242 (0.908)			0.0163 (0.924)			0.00714 (0.932)			0.00614 (0.938)			0.00534 (0.943)			0.00360 (0.947)			0.00326 (0.950)			
Latin	-	e	t	e	-	t	e	t	-	-	e	t	-	e	t	-	e	-	t	-	e	t	-	e	t	-	-
Romanian	j	e	-	j	e	-	j	-	e	j	-	e	j	-	e	j	e	-	-	j	e	-	-	j	e	-	-
Portuguese	-	i	-	i	-	-	i	-	-	-	i	-	i	-	-	-	-	i	-	-	i	-	-	-	i	-	-
Spanish	-	i	-	i	-	-	i	-	-	-	i	-	i	-	-	-	-	i	-	-	i	-	-	-	i	-	-
Catalan	-	i	-	i	-	-	i	-	-	-	i	-	i	-	-	-	-	i	-	-	i	-	-	-	i	-	-
French	-	e	-	e	-	-	e	-	-	-	e	-	e	-	-	-	-	e	-	-	-	-	e	-	-	-	e
Walloon	-	ɛ	-	ɛ	-	-	ɛ	-	-	-	ɛ	-	ɛ	-	-	-	-	ɛ	-	-	-	-	ɛ	-	-	ɛ	-
Friulian	-	e	-	e	-	-	e	-	-	-	e	-	e	-	-	-	e	-	-	-	e	-	-	-	e	-	-
Italian	-	e	-	e	-	-	e	-	-	-	e	-	e	-	-	-	e	-	-	-	e	-	-	-	e	-	-

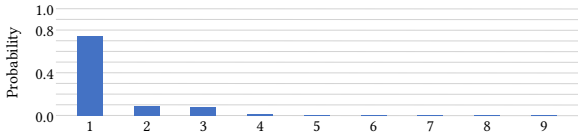
And



	0.789			0.0276 (0.816)				0.0260 (0.842)				0.0256 (0.868)				0.0220 (0.890)				0.0156 (0.906)				0.0152 (0.921)				0.0146 (0.935)			
Latin	s	iː	k	s	iː	-	k	s	-	iː	k	s	iː	k	-	s	iː	-	k	s	-	iː	k	s	iː	k	-	s	-	iː	k
Romanian	ʃ	i	-	ʃ	i	-	-	ʃ	-	i	-	ʃ	-	-	i	ʃ	-	i	-	ʃ	i	-	-	ʃ	i	-	-	-	ʃ	i	-
Portuguese	s	ĩ	-	s	-	ĩ	-	s	ĩ	-	-	s	-	-	ĩ	s	-	ĩ	-	s	ĩ	-	-	s	-	-	ĩ	s	-	ĩ	-
Spanish	s	i	-	s	i	-	-	s	-	i	-	s	-	-	i	s	-	i	-	s	i	-	-	s	i	-	-	s	-	i	-
Catalan	s	i	-	s	i	-	-	s	-	i	-	s	-	-	i	s	-	i	-	s	i	-	-	s	i	-	-	s	-	i	-
French	s	i	-	s	i	-	-	s	-	i	-	s	-	-	i	s	-	i	-	s	i	-	-	s	i	-	-	s	-	i	-
Walloon	s	i	-	s	i	-	-	s	-	i	-	s	-	-	i	s	-	i	-	s	i	-	-	s	i	-	-	s	-	i	-
Friulian	s	i	-	s	i	-	-	s	-	i	-	s	-	-	i	s	-	i	-	s	i	-	-	s	i	-	-	s	-	i	-
Italian	s	i	-	s	i	-	-	s	-	i	-	s	-	-	i	s	-	i	-	s	i	-	-	s	i	-	-	s	-	i	-

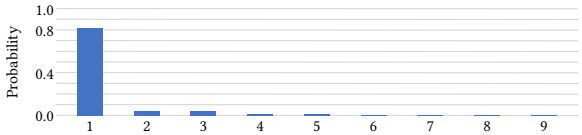
0.0142 (0.950)		
s	iː	k
ʃ	-	i
s	-	ĩ
s	-	i
s	-	i
s	-	i
s	-	i
s	-	i
s	-	i

In



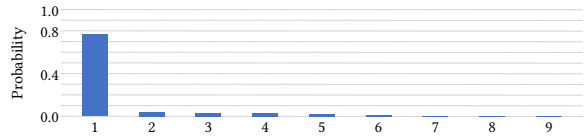
	0.741		0.0893 (0.830)		0.0823 (0.913)		0.0102 (0.923)			0.00806 (0.931)		0.00560 (0.936)			0.00417 (0.941)			0.00363 (0.944)			0.00314 (0.947)		
Latin	i	n	i	n	i	n	-	i	n	i	n	i	-	n	i	-	n	i	n	-	-	i	n
Romanian	ɨ	n	ɨ	n	ɨ	n	ɨ	-	n	ɨ	n	-	ɨ	n	ɨ	n	-	ɨ	-	n	-	ɨ	n
Portuguese	-	ɐ̃j	ɐ̃j	-	-	ɐ̃j	-	-	ɐ̃j	ɐ̃j	-	-	-	ɐ̃j	-	ɐ̃j	-	-	ɐ̃j	-	-	-	ɐ̃j
Spanish	e	n	e	n	e	n	-	e	n	e	n	e	-	n	e	n	-	e	n	-	e	-	n
Catalan	ə	n	ə	n	ə	n	-	ə	n	ə	n	ə	-	n	ə	n	-	ə	n	-	-	ə	n
French	-	ɑ̃	-	ɑ̃	ɑ̃	-	-	-	ɑ̃	ɑ̃	-	-	-	ɑ̃	-	ɑ̃	-	-	ɑ̃	-	-	-	ɑ̃
Walloon	ɛ	n	ɛ	n	ɛ	n	-	ɛ	n	ɛ	n	ɛ	-	n	ɛ	n	-	ɛ	n	-	-	ɛ	n
Friulian	i	n	i	n	i	n	-	i	n	i	n	i	-	n	i	n	-	i	n	-	-	i	n
Italian	i	n	i	n	i	n	-	i	n	i	n	i	-	n	i	n	-	i	n	-	-	i	n

YouSingular



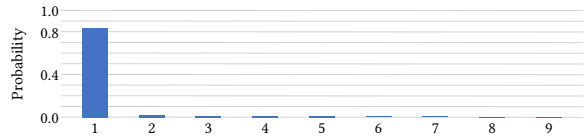
	0.816		0.0413 (0.858)			0.0402 (0.898)			0.0121 (0.910)			0.0109 (0.921)			0.00789 (0.929)			0.00751 (0.936)			0.00543 (0.942)			0.00391 (0.946)		
Latin	t	uː	t	-	uː	t	uː	-	t	-	uː	t	uː	-	t	-	uː	t	uː	-	t	uː	-	t	uː	-
Romanian	t	u	t	u	-	t	-	u	t	u	-	t	-	u	t	-	u	t	u	-	t	u	-	t	u	-
Portuguese	t	u	t	u	-	t	-	u	t	-	u	t	u	-	t	-	u	t	u	-	t	u	-	t	u	-
Spanish	t	u	t	u	-	t	-	u	t	-	u	t	u	-	t	-	u	t	u	-	t	u	-	t	u	-
Catalan	t	u	t	u	-	t	-	u	t	-	u	t	u	-	t	-	u	t	u	-	t	u	-	t	-	u
French	t	y	t	y	-	t	-	y	t	-	y	t	y	-	t	y	-	t	-	y	t	y	-	t	-	y
Walloon	t	i	t	i	-	t	-	i	t	-	i	t	i	-	t	i	-	t	-	i	t	-	i	t	-	i
Friulian	t	u	t	u	-	t	-	u	t	-	u	t	u	-	t	-	u	t	u	-	t	u	-	t	u	-
Italian	t	u	t	u	-	t	-	u	t	-	u	t	u	-	t	-	u	t	u	-	t	u	-	t	u	-

If



	0.768	0.0399 (0.808)	0.0338 (0.842)	0.0301 (0.872)	0.0261 (0.898)	0.00997 (0.908)	0.00883 (0.917)	0.00863 (0.926)	0.00534 (0.931)
Latin	s iː	s – iː	s iː –	s – iː	s iː –	s – iː	s – iː	s iː –	s iː –
Romanian	s ə	s ə –	s – ə	s ə –	s – ə	s – ə	s – ə	s ə –	s ə –
Portuguese	s ɨ	s ɨ –	s – ɨ	s – ɨ	s ɨ –	s ɨ –	s ɨ –	s – ɨ	s – ɨ
Spanish	s i	s i –	s – i	s – i	s i –	s i –	s i –	s – i	s – i
Catalan	s i	s i –	s – i	s – i	s i –	s i –	s i –	s – i	s – i
French	s i	s i –	s – i	s – i	s i –	s i –	s i –	s – i	s – i
Walloon	s i	s i –	s – i	s – i	s i –	s i –	s i –	s – i	s – i
Friulian	s e	s e –	s – e	s – e	s e –	s e –	s – e	s – e	s e –
Italian	s e	s e –	s – e	s – e	s e –	s – e	s – e	s e –	s e –

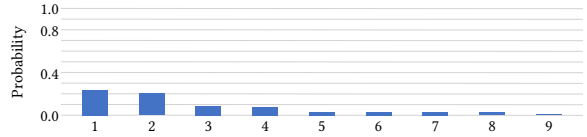
Salt



	0.835	0.0208 (0.856)	0.0123 (0.869)	0.0113 (0.880)	0.0102 (0.890)
Latin	s a l e m	s a l e m	s a l – e m	s a – l e m	s a l e – m
Romanian	s a r e –	s a r e –	s a – r e –	s a r – e –	s a r – e –
Portuguese	s a l – –	s a l – –	s a l – – –	s a – l – –	s a l – – –
Spanish	s a l – –	s a l – –	s a l – – –	s a – l – –	s a l – – –
Catalan	s a l – –	s a l – –	s a l – – –	s a – l – –	s a l – – –
French	s ɛ l – –	s ɛ l – –	s ɛ l – – –	s ɛ – l – –	s ɛ l – – –
Walloon	s e – – –	s – e – –	s e – – – –	s e – – – –	s e – – – –
Friulian	s aː l – –	s aː l – –	s aː l – – –	s aː – l – –	s aː l – – –
Italian	s a l e –	s a l e –	s a l – e –	s a – l e –	s a l – e –

0.00903 (0.899)	0.00703 (0.906)	0.00651 (0.913)	0.00551 (0.918)
s a l – e m	s a l – e m	s a l e m –	s a l – e m
s a r – e –	s a r e – –	s a r – – e	s a r e – –
s a l – – –	s a l – – –	s a l – – –	s a l – – –
s a l – – –	s a l – – –	s a l – – –	s a l – – –
s a l – – –	s a l – – –	s a l – – –	s a l – – –
s ɛ l – – –	s ɛ l – – –	s ɛ l – – –	s ɛ l – – –
s – – e – –	s e – – – –	s e – – – –	s e – – – –
s aː l – – –	s aː l – – –	s aː l – – –	s aː l – – –
s a l – e –	s a l e – –	s a l – – e	s a l – e –

All



	0.241	0.205 (0.446)	0.0865 (0.532)	0.0786 (0.611)	0.0353 (0.646)
Latin	t oː t – u m	t oː – t u m	t oː t – u m	t oː – t u m	t oː t – u m
Romanian	t o t – – –	t o – t – –	t o t – – –	t o – t – –	t o – t – –
Portuguese	t o d – u –	t o – d u –	t o – d u –	t o d – u –	t o d – u –
Spanish	t o d – o –	t o – d o –	t o – d o –	t o d – o –	t o d – o –
Catalan	t o t – – –	t o – t – –	t o – t – –	t o t – – –	t o t – – –
French	t u – – – –	t u – – – –	t u – – – –	t u – – – –	t u – – – –
Walloon	t ɔ – – – –	t ɔ – – – –	t ɔ – – – –	t ɔ – – – –	t ɔ – – – –
Friulian	d u t – – –	d u – t – –	d u – t – –	d u t – – –	d u t – – –
Italian	t u t t o –	t u t t o –	t u t t o –	t u t t o –	t u t t o –

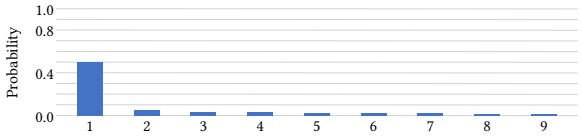
0.0295 (0.676)					
t	oː	-	t	u	m
t	o	t	-	-	-
t	o	d	-	u	-
t	o	d	-	o	-
t	o	t	-	-	-
t	u	-	-	-	-
t	ɔ	-	-	-	-
d	u	t	-	-	-
t	u	t	t	o	-

0.0295 (0.705)					
t	oː	t	-	u	m
t	o	-	t	-	-
t	o	-	d	u	-
t	o	-	d	o	-
t	o	-	t	-	-
t	u	-	-	-	-
t	ɔ	-	-	-	-
d	u	-	t	-	-
t	u	t	t	o	-

0.0265 (0.732)					
t	oː	-	t	u	m
t	o	t	-	-	-
t	o	-	d	u	-
t	o	-	d	o	-
t	o	-	t	-	-
t	u	-	-	-	-
t	ɔ	-	-	-	-
d	u	-	t	-	-
t	u	t	t	o	-

0.00769 (0.739)					
t	oː	t	-	u	m
t	o	t	-	-	-
t	o	d	-	-	u
t	o	d	-	-	o
t	o	t	-	-	-
t	u	-	-	-	-
t	ɔ	-	-	-	-
d	u	t	-	-	-
t	u	t	t	-	o

Belly



	0.502							
Latin	p	a	n	t	i	k	e	m
Romanian	p	ɨ	n	t	e	ʧ	e	-
Portuguese	p	-	ɐ̃	-	-	s	ɐ	-
Spanish	p	a	n	-	-	θ	a	-
Catalan	p	a	ɲ	-	-	ʃ	ə	-
French	p	-	ɑ̃	-	-	s	-	-
Walloon	p	-	ɑ̃	-	-	s	-	-
Friulian	p	a	n	-	-	ʦ	e	-
Italian	p	a	n	-	-	ʧ	a	-

	0.0495 (0.552)							
Latin	p	a	n	t	i	k	e	m
Romanian	p	ɨ	n	t	e	ʧ	e	-
Portuguese	p	ɐ̃	-	-	-	s	ɐ	-
Spanish	p	a	n	-	-	θ	a	-
Catalan	p	a	ɲ	-	-	ʃ	ə	-
French	p	-	ɑ̃	-	-	s	-	-
Walloon	p	-	ɑ̃	-	-	s	-	-
Friulian	p	a	n	-	-	ʦ	e	-
Italian	p	a	n	-	-	ʧ	a	-

	0.0342 (0.586)							
Latin	p	a	n	t	i	k	e	m
Romanian	p	ɨ	n	t	e	ʧ	e	-
Portuguese	p	-	ɐ̃	s	ɐ	-	-	-
Spanish	p	a	n	θ	a	-	-	-
Catalan	p	a	ɲ	ʃ	ə	-	-	-
French	p	-	ɑ̃	s	-	-	-	-
Walloon	p	-	ɑ̃	s	-	-	-	-
Friulian	p	a	n	ʦ	e	-	-	-
Italian	p	a	n	ʧ	a	-	-	-

	0.0340 (0.620)							
Latin	p	a	n	t	i	k	e	m
Romanian	p	ɨ	n	t	e	ʧ	e	-
Portuguese	p	-	ɐ̃	-	-	s	ɐ	-
Spanish	p	a	n	-	-	θ	a	-
Catalan	p	a	ɲ	-	-	ʃ	ə	-
French	p	ɑ̃	-	-	-	s	-	-
Walloon	p	ɑ̃	-	-	-	s	-	-
Friulian	p	a	n	-	-	ʦ	e	-
Italian	p	a	n	-	-	ʧ	a	-

0.0222 (0.642)								
p	a	n	t	i	-	k	e	m
p	ɨ	n	t	-	e	ʧ	e	-
p	-	ɐ̃	-	-	-	s	ɐ	-
p	a	n	-	-	-	θ	a	-
p	a	ɲ	-	-	-	ʃ	ə	-
p	-	ɑ̃	-	-	-	s	-	-
p	-	ɑ̃	-	-	-	s	-	-
p	a	n	-	-	-	ʦ	e	-
p	a	n	-	-	-	ʧ	a	-

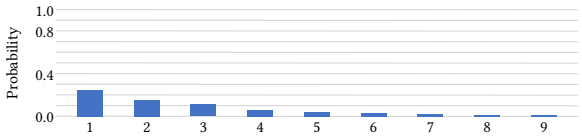
0.0216 (0.664)								
p	a	n	t	i	k	-	e	m
p	ɨ	n	t	e	-	ʧ	e	-
p	-	ɐ̃	-	-	-	s	ɐ	-
p	a	n	-	-	-	θ	a	-
p	a	ɲ	-	-	-	ʃ	ə	-
p	-	ɑ̃	-	-	-	s	-	-
p	-	ɑ̃	-	-	-	s	-	-
p	a	n	-	-	-	ʦ	e	-
p	a	n	-	-	-	ʧ	a	-

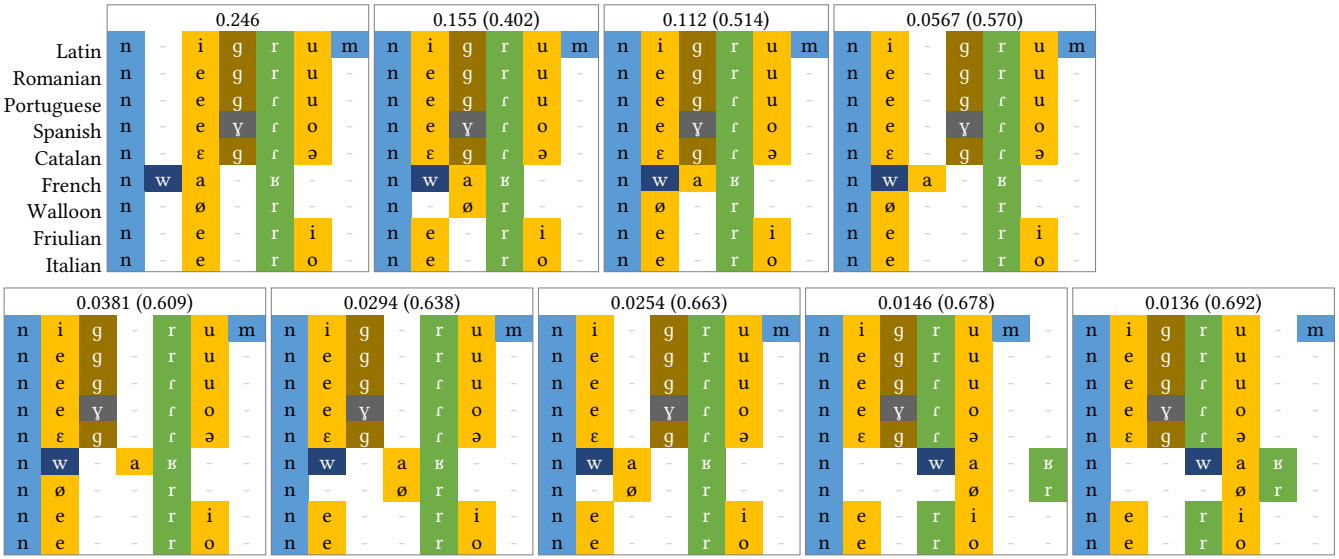
0.0206 (0.685)								
p	a	n	t	-	i	k	e	m
p	ɨ	n	t	e	-	ʧ	e	-
p	-	ɐ̃	-	-	-	s	ɐ	-
p	a	n	-	-	-	θ	a	-
p	a	ɲ	-	-	-	ʃ	ə	-
p	-	ɑ̃	-	-	-	s	-	-
p	-	ɑ̃	-	-	-	s	-	-
p	a	n	-	-	-	ʦ	e	-
p	a	n	-	-	-	ʧ	a	-

0.0163 (0.701)								
p	a	n	t	i	k	e	m	
p	ɨ	n	t	e	ʧ	e	-	
p	-	ɐ̃	s	-	-	ɐ	-	
p	a	n	θ	-	-	a	-	
p	a	ɲ	ʃ	-	-	ə	-	
p	-	ɑ̃	s	-	-	-	-	
p	-	ɑ̃	s	-	-	-	-	
p	a	n	ʦ	-	-	e	-	
p	a	n	ʧ	-	-	a	-	

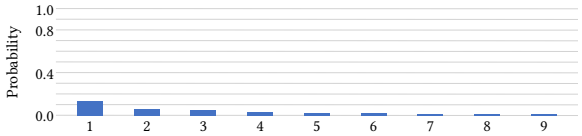
0.0111 (0.712)								
p	a	n	t	i	-	k	e	m
p	ɨ	n	t	e	ʧ	-	e	-
p	-	ɐ̃	-	-	s	-	ɐ	-
p	a	n	-	-	θ	-	a	-
p	a	ɲ	-	-	ʃ	-	ə	-
p	-	ɑ̃	-	-	s	-	-	-
p	-	ɑ̃	-	-	s	-	-	-
p	a	n	-	-	ʦ	-	e	-
p	a	n	-	-	ʧ	-	a	-

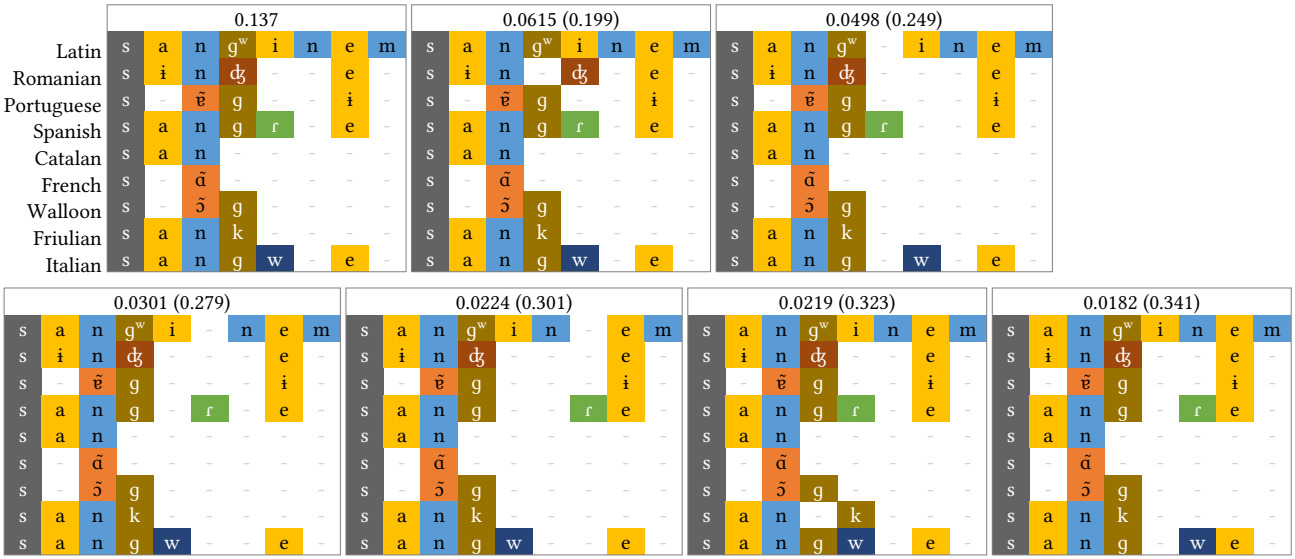
Black

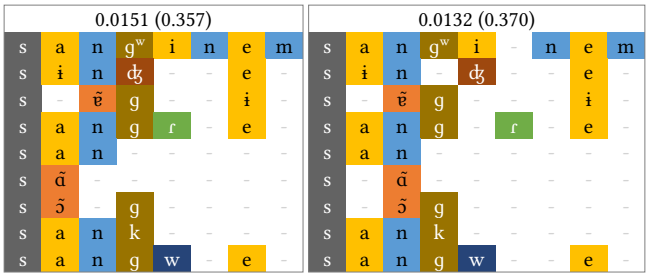

Probability
1.0
0.8
0.4
0.0
1 2 3 4 5 6 7 8 9


Latin
Romanian
Portuguese
Spanish
Catalan
French
Walloon
Friulian
Italian
0.246
0.155 (0.402)
0.112 (0.514)
0.0567 (0.570)
0.0381 (0.609)
0.0294 (0.638)
0.0254 (0.663)
0.0146 (0.678)
0.0136 (0.692)

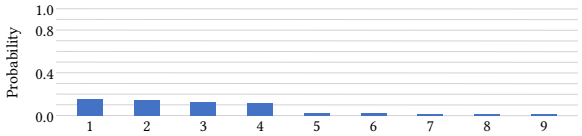
Blood

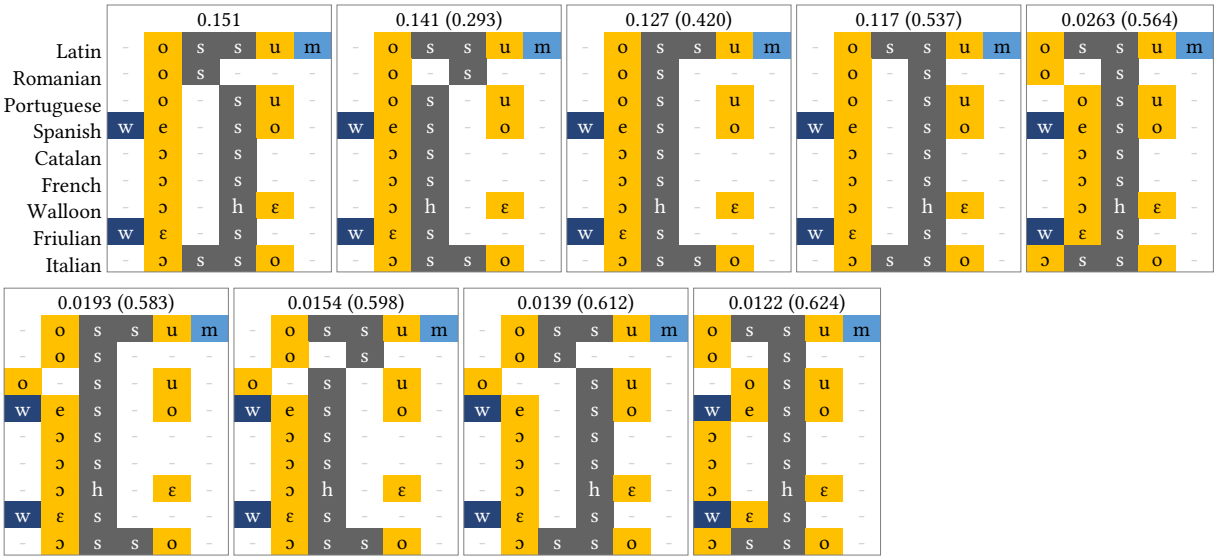

Probability
1.0
0.8
0.4
0.0
1 2 3 4 5 6 7 8 9


Latin
Romanian
Portuguese
Spanish
Catalan
French
Walloon
Friulian
Italian
0.137
0.0615 (0.199)
0.0498 (0.249)
0.0301 (0.279)
0.0224 (0.301)
0.0219 (0.323)
0.0182 (0.341)

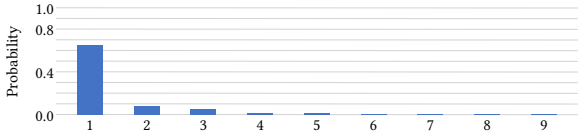

0.0151 (0.357)
0.0132 (0.370)

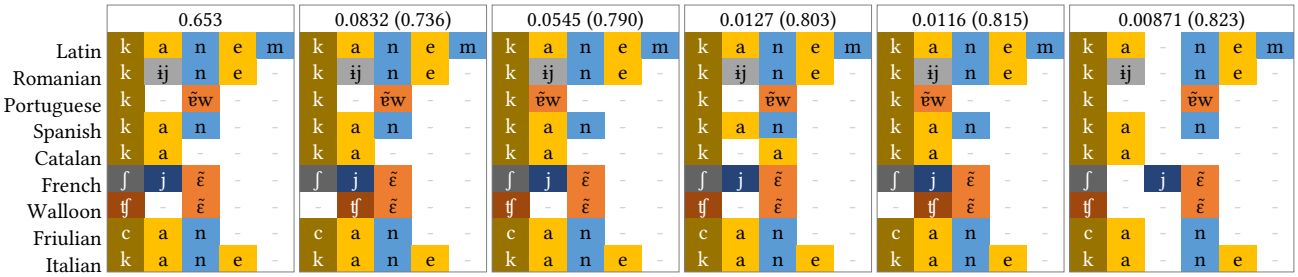
Bone


Probability
1.0
0.8
0.4
0.0
1 2 3 4 5 6 7 8 9


Latin
Romanian
Portuguese
Spanish
Catalan
French
Walloon
Friulian
Italian
0.151
0.141 (0.293)
0.127 (0.420)
0.117 (0.537)
0.0263 (0.564)
0.0193 (0.583)
0.0154 (0.598)
0.0139 (0.612)
0.0122 (0.624)

Dog


Probability
1.0
0.8
0.4
0.0
1 2 3 4 5 6 7 8 9

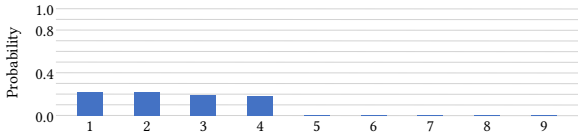

Latin
Romanian
Portuguese
Spanish
Catalan
French
Walloon
Friulian
Italian
0.653
0.0832 (0.736)
0.0545 (0.790)
0.0127 (0.803)
0.0116 (0.815)
0.00871 (0.823)

0.00846 (0.832)					
k	-	a	n	e	m
k	-	ɨj	n	e	-
k	-	-	ɛ̃w	-	-
k	-	a	n	-	-
k	-	a	-	-	-
ʃ	-	j	ɛ̃	-	-
ʧ	-	-	ɛ̃	-	-
-	c	a	n	-	-
k	-	a	n	e	-

0.00840 (0.840)					
-	k	a	n	e	m
-	k	ɨj	n	e	-
-	k	-	ɛ̃w	-	-
-	k	a	n	-	-
-	k	a	-	-	-
-	ʃ	j	ɛ̃	-	-
-	ʧ	-	ɛ̃	-	-
c	-	a	n	-	-
-	k	a	n	e	-

0.00777 (0.848)					
k	-	a	n	e	m
k	ɨj	-	n	e	-
k	-	-	ɛ̃w	-	-
k	-	a	n	-	-
k	-	a	-	-	-
ʃ	-	j	ɛ̃	-	-
ʧ	-	-	ɛ̃	-	-
c	-	a	n	-	-
k	-	a	n	e	-

Dry



	0.223					
Latin	s	i	k	k	u	m
Romanian	s	e	-	k	-	-
Portuguese	s	e	k	-	u	-
Spanish	s	e	k	-	o	-
Catalan	s	ɛ	k	-	-	-
French	s	ɛ	k	-	-	-
Walloon	s	ɛ	ʧ	-	-	-
Friulian	s	ɛ	k	-	-	-
Italian	s	e	k	k	o	-

	0.219 (0.442)					
Latin	s	i	k	k	u	m
Romanian	s	e	k	-	-	-
Portuguese	s	e	-	k	u	-
Spanish	s	e	-	k	o	-
Catalan	s	ɛ	-	k	-	-
French	s	ɛ	-	k	-	-
Walloon	s	ɛ	-	ʧ	-	-
Friulian	s	ɛ	-	k	-	-
Italian	s	e	k	k	o	-

	0.190 (0.632)					
Latin	s	i	k	k	u	m
Romanian	s	e	-	k	-	-
Portuguese	s	e	-	k	u	-
Spanish	s	e	-	k	o	-
Catalan	s	ɛ	-	k	-	-
French	s	ɛ	-	k	-	-
Walloon	s	ɛ	-	ʧ	-	-
Friulian	s	ɛ	-	k	-	-
Italian	s	e	k	k	o	-

	0.184 (0.816)					
Latin	s	i	k	k	u	m
Romanian	s	e	k	-	-	-
Portuguese	s	e	k	-	u	-
Spanish	s	e	k	-	o	-
Catalan	s	ɛ	k	-	-	-
French	s	ɛ	k	-	-	-
Walloon	s	ɛ	ʧ	-	-	-
Friulian	s	ɛ	k	-	-	-
Italian	s	e	k	k	o	-

	0.00469 (0.820)						
Latin	s	i	k	k	u	m	-
Romanian	s	e	k	-	-	-	-
Portuguese	s	e	-	k	-	-	u
Spanish	s	e	-	k	-	-	o
Catalan	s	ɛ	-	k	-	-	-
French	s	ɛ	-	k	-	-	-
Walloon	s	ɛ	-	ʧ	-	-	-
Friulian	s	ɛ	-	k	-	-	-
Italian	s	e	k	k	-	-	o

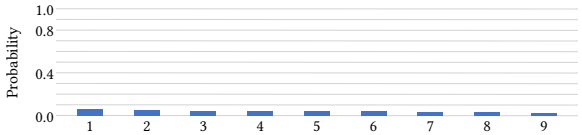
0.00451 (0.825)						
s	-	i	k	k	u	m
s	e	-	k	-	-	-
s	e	-	-	k	u	-
s	e	-	-	k	o	-
s	ɛ	-	-	k	-	-
s	ɛ	-	-	k	-	-
s	ɛ	-	-	ʧ	-	-
s	ɛ	-	-	k	-	-
s	e	-	k	k	o	-

0.00429 (0.829)						
s	i	k	k	u	-	m
s	e	k	-	-	-	-
s	e	k	-	-	u	-
s	e	k	-	-	o	-
s	ɛ	k	-	-	-	-
s	ɛ	k	-	-	-	-
s	ɛ	ʧ	-	-	-	-
s	ɛ	k	-	-	-	-
s	e	k	k	-	o	-

0.00414 (0.833)						
s	i	k	k	u	-	m
s	e	k	-	-	-	-
s	e	-	k	-	u	-
s	e	-	k	-	o	-
s	ɛ	-	k	-	-	-
s	ɛ	-	k	-	-	-
s	ɛ	-	ʧ	-	-	-
s	ɛ	-	k	-	-	-
s	e	k	k	-	o	-

0.00409 (0.837)						
s	i	k	k	-	u	m
s	e	k	-	-	-	-
s	e	k	-	u	-	-
s	e	k	-	o	-	-
s	ɛ	k	-	-	-	-
s	ɛ	k	-	-	-	-
s	ɛ	ʧ	-	-	-	-
s	ɛ	k	-	-	-	-
s	e	k	k	o	-	-

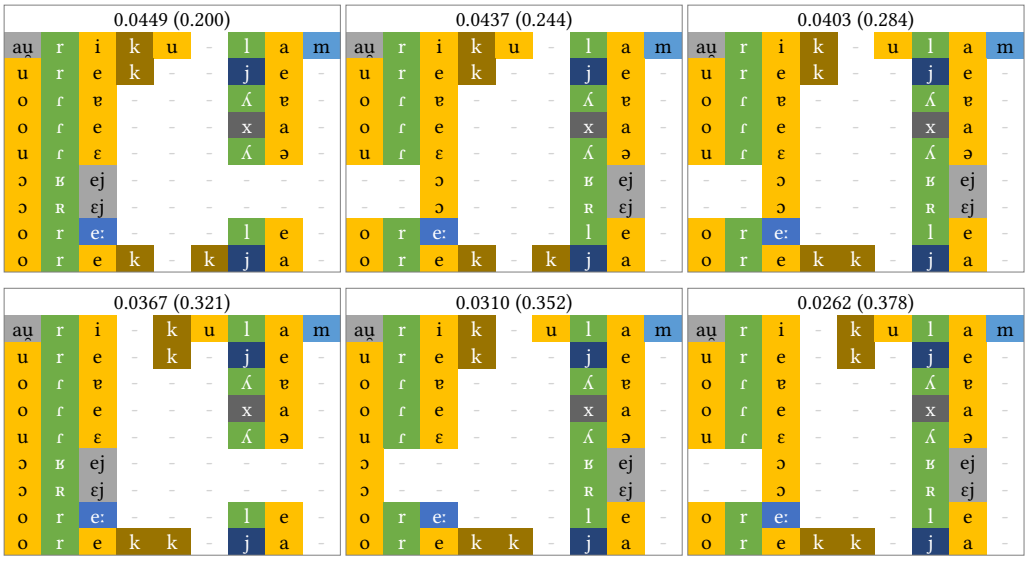
Ear



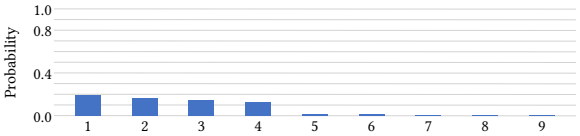
	0.0589								
Latin	au̯	r	i	k	u	-	l	a	m
Romanian	u	r	e	k	-	-	j	e	-
Portuguese	o	ɾ	ɐ	-	-	-	ʎ	ɐ	-
Spanish	o	ɾ	e	-	-	-	x	a	-
Catalan	u	ɾ	ɛ	-	-	-	ʎ	ə	-
French	ɔ	ʁ	-	-	-	-	-	ej	-
Walloon	ɔ	ʀ	-	-	-	-	-	ɛj	-
Friulian	o	r	eː	-	-	-	l	e	-
Italian	o	r	e	k	-	k	j	a	-

	0.0505 (0.109)								
Latin	au̯	r	i	k	-	u	l	a	m
Romanian	u	r	e	k	-	-	j	e	-
Portuguese	o	ɾ	ɐ	-	-	-	ʎ	ɐ	-
Spanish	o	ɾ	e	-	-	-	x	a	-
Catalan	u	ɾ	ɛ	-	-	-	ʎ	ə	-
French	ɔ	ʁ	-	-	-	-	-	ej	-
Walloon	ɔ	ʀ	-	-	-	-	-	ɛj	-
Friulian	o	r	eː	-	-	-	l	e	-
Italian	o	r	e	k	k	-	j	a	-

	0.0460 (0.155)								
Latin	au̯	r	i	k	u	-	l	a	m
Romanian	u	r	e	k	-	-	j	e	-
Portuguese	o	ɾ	ɐ	-	-	-	ʎ	ɐ	-
Spanish	o	ɾ	e	-	-	-	x	a	-
Catalan	u	ɾ	ɛ	-	-	-	ʎ	ə	-
French	ɔ	-	-	-	-	-	ʁ	ej	-
Walloon	ɔ	-	-	-	-	-	ʀ	ɛj	-
Friulian	o	r	eː	-	-	-	l	e	-
Italian	o	r	e	k	-	k	j	a	-

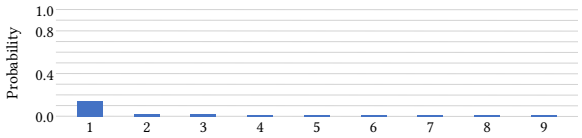

0.0449 (0.200)
0.0437 (0.244)
0.0403 (0.284)
0.0367 (0.321)
0.0310 (0.352)
0.0262 (0.378)

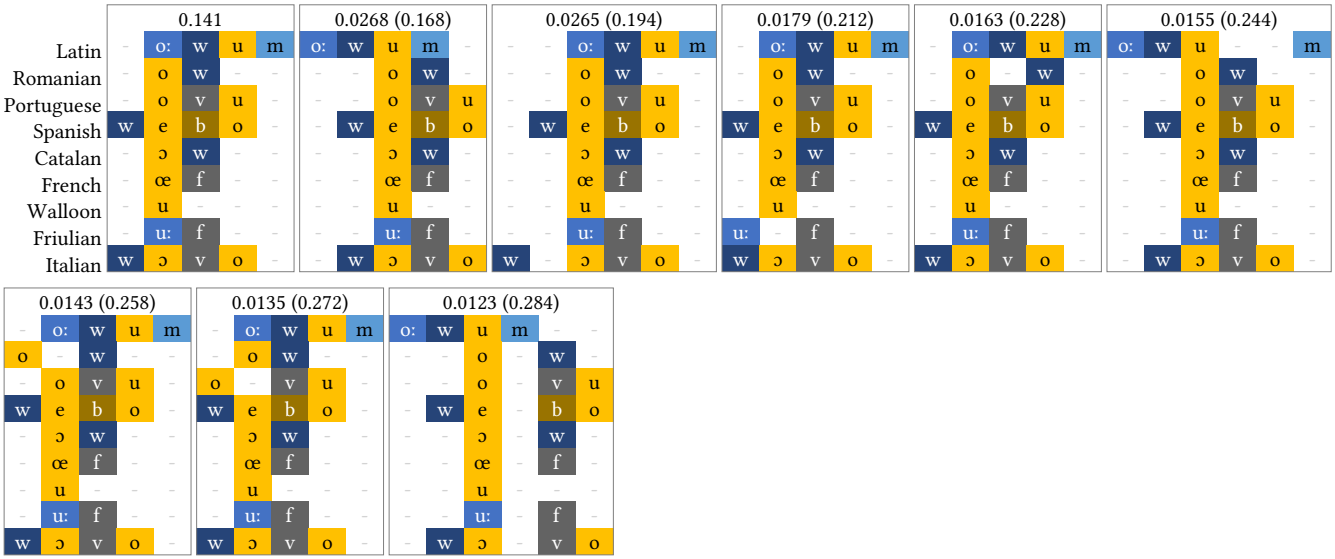
Earth


Probability
1.0
0.8
0.4
0.0
1
2
3
4
5
6
7
8
9

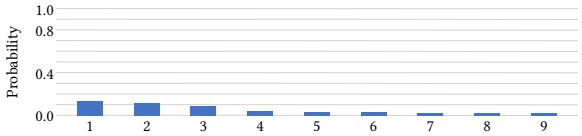
0.196
0.168 (0.365)
0.148 (0.513)
0.127 (0.640)
Latin
Romanian
Portuguese
Spanish
Catalan
French
Walloon
Friulian
Italian
0.0106 (0.650)
0.0105 (0.661)
0.00637 (0.667)
0.00523 (0.673)
0.00523 (0.678)

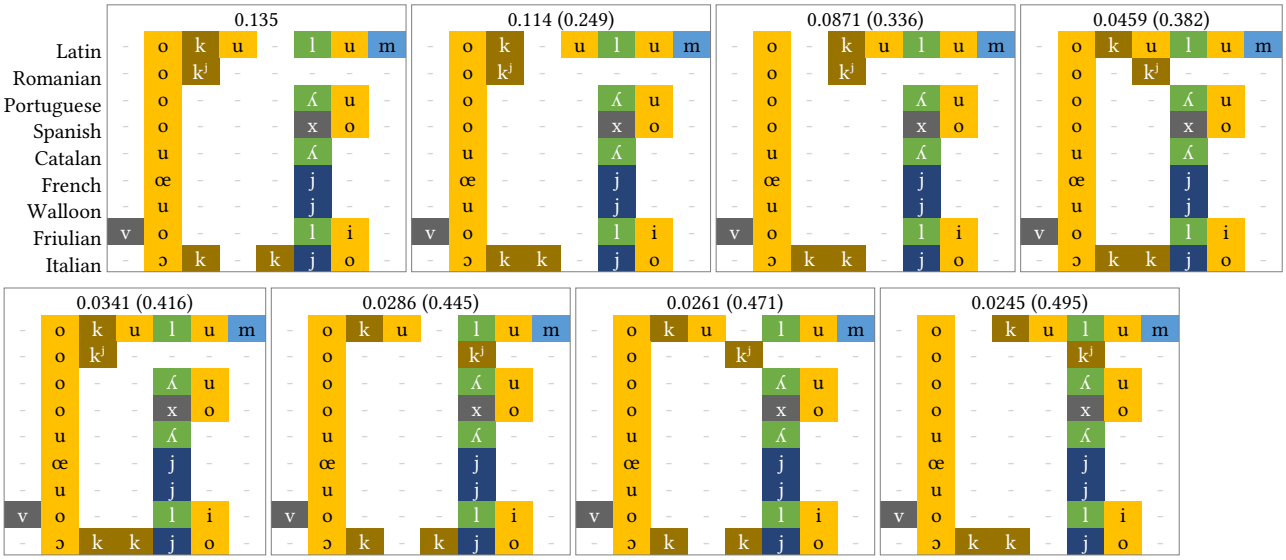
Egg

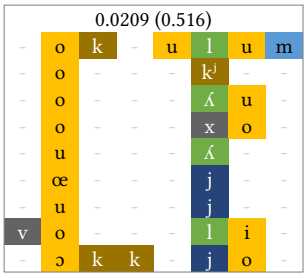

Probability
1.0
0.8
0.4
0.0
1 2 3 4 5 6 7 8 9


Latin
Romanian
Portuguese
Spanish
Catalan
French
Walloon
Friulian
Italian
0.141
0.0268 (0.168)
0.0265 (0.194)
0.0179 (0.212)
0.0163 (0.228)
0.0155 (0.244)
0.0143 (0.258)
0.0135 (0.272)
0.0123 (0.284)

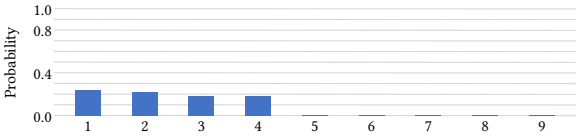
Eye

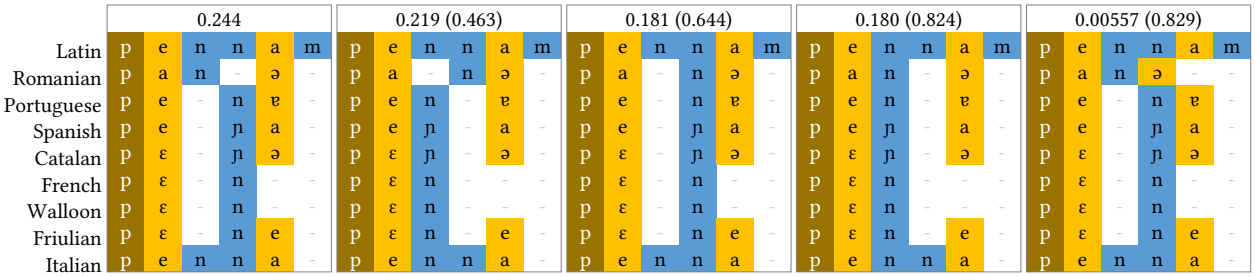

Probability
1.0
0.8
0.4
0.0
1 2 3 4 5 6 7 8 9

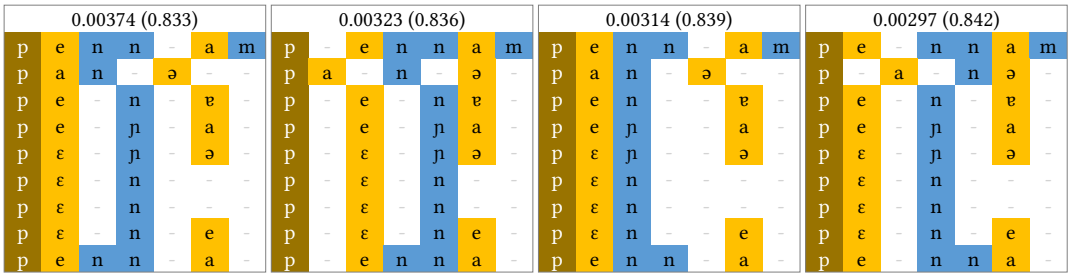

Latin
Romanian
Portuguese
Spanish
Catalan
French
Walloon
Friulian
Italian
0.135
0.114 (0.249)
0.0871 (0.336)
0.0459 (0.382)
0.0341 (0.416)
0.0286 (0.445)
0.0261 (0.471)
0.0245 (0.495)



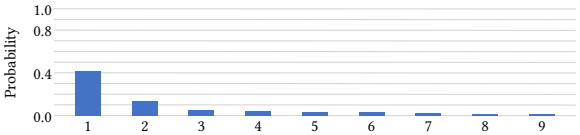
Feather

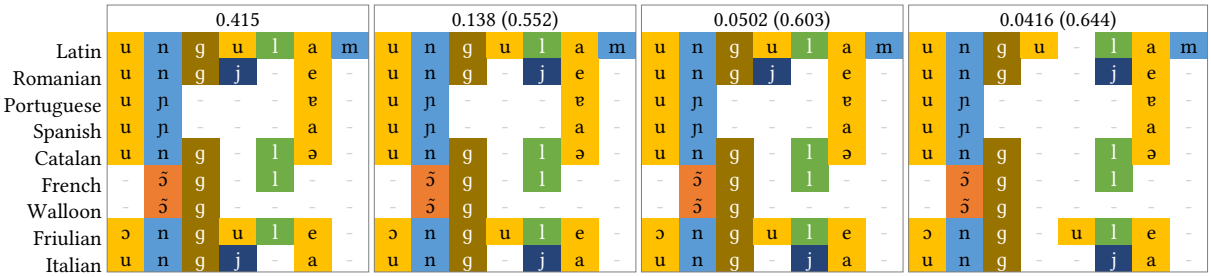






Fingernail





0.0345 (0.679)						
u	n	ɡ	u	l	a	m
u	n	ɡ	-	j	e	-
u	ɲ	-	-	-	ɐ	-
u	ɲ	-	-	-	a	-
u	n	ɡ	-	l	ə	-
-	ɔ̃	ɡ	-	l	-	-
-	ɔ̃	ɡ	-	-	-	-
ɔ	n	ɡ	u	l	e	-
u	n	ɡ	j	-	a	-

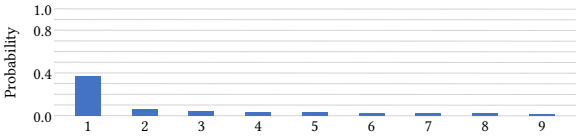
0.0337 (0.712)						
u	n	ɡ	-	u	l	a	m
u	n	ɡ	-	-	j	e	-
u	ɲ	-	-	-	-	ɐ	-
u	ɲ	-	-	-	-	a	-
u	n	ɡ	-	-	l	ə	-
-	ɔ̃	ɡ	-	-	l	-	-
-	ɔ̃	ɡ	-	-	-	-	-
ɔ	n	ɡ	u	-	l	e	-
u	n	ɡ	-	-	j	a	-

0.0226 (0.735)						
u	n	ɡ	u	l	a	m
u	n	ɡ	j	-	e	-
u	ɲ	-	-	-	ɐ	-
u	ɲ	-	-	-	a	-
u	n	ɡ	-	l	ə	-
ɔ̃	-	ɡ	-	l	-	-
ɔ̃	-	ɡ	-	-	-	-
ɔ	n	ɡ	u	l	e	-
u	n	ɡ	j	-	a	-

0.0110 (0.746)						
u	n	ɡ	u	-	l	a	m
u	n	ɡ	-	j	-	e	-
u	ɲ	-	-	-	-	ɐ	-
u	ɲ	-	-	-	-	a	-
u	n	ɡ	-	-	l	ə	-
-	ɔ̃	ɡ	-	-	l	-	-
-	ɔ̃	ɡ	-	-	-	-	-
ɔ	n	ɡ	-	u	l	e	-
u	n	ɡ	-	j	-	a	-

0.00991 (0.756)						
u	n	ɡ	u	l	a	m
u	n	ɡ	-	j	e	-
u	ɲ	-	-	-	ɐ	-
u	ɲ	-	-	-	a	-
u	n	ɡ	-	l	ə	-
ɔ̃	-	ɡ	-	l	-	-
ɔ̃	-	ɡ	-	-	-	-
ɔ	n	ɡ	u	l	e	-
u	n	ɡ	-	j	a	-

Fire



	0.370					
Latin	f	-	o	k	u	m
Romanian	f	-	o	k	-	-
Portuguese	f	-	o	ɡ	u	-
Spanish	f	w	e	ɡ	o	-
Catalan	f	-	ɔ	k	-	-
French	f	-	ø	-	-	-
Walloon	f	-	œ	-	-	-
Friulian	f	-	uː	k	-	-
Italian	f	w	ɔ	k	o	-

	0.0603 (0.430)					
Latin	f	-	o	k	u	m
Romanian	f	-	o	k	-	-
Portuguese	f	-	o	ɡ	u	-
Spanish	f	w	e	ɡ	o	-
Catalan	f	-	ɔ	k	-	-
French	f	-	ø	-	-	-
Walloon	f	-	œ	-	-	-
Friulian	f	uː	-	k	-	-
Italian	f	w	ɔ	k	o	-

	0.0392 (0.469)					
Latin	f	-	o	k	u	m
Romanian	f	-	o	k	-	-
Portuguese	f	o	-	ɡ	u	-
Spanish	f	w	e	ɡ	o	-
Catalan	f	-	ɔ	k	-	-
French	f	-	ø	-	-	-
Walloon	f	-	œ	-	-	-
Friulian	f	-	uː	k	-	-
Italian	f	w	ɔ	k	o	-

	0.0360 (0.505)					
Latin	f	o	-	k	u	m
Romanian	f	o	-	k	-	-
Portuguese	f	-	o	ɡ	u	-
Spanish	f	w	e	ɡ	o	-
Catalan	f	-	ɔ	k	-	-
French	f	-	ø	-	-	-
Walloon	f	-	œ	-	-	-
Friulian	f	-	uː	k	-	-
Italian	f	w	ɔ	k	o	-

	0.0307 (0.536)					
Latin	f	-	o	k	u	m
Romanian	f	-	o	k	-	-
Portuguese	f	-	o	ɡ	u	-
Spanish	f	w	e	ɡ	o	-
Catalan	f	ɔ	-	k	-	-
French	f	ø	-	-	-	-
Walloon	f	œ	-	-	-	-
Friulian	f	-	uː	k	-	-
Italian	f	w	ɔ	k	o	-

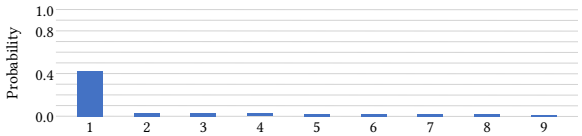
0.0273 (0.563)					
f	o	-	k	u	m
f	-	o	k	-	-
f	-	o	ɡ	u	-
f	w	e	ɡ	o	-
f	-	ɔ	k	-	-
f	-	ø	-	-	-
f	-	œ	-	-	-
f	-	uː	k	-	-
f	w	ɔ	k	o	-

0.0258 (0.589)					
f	-	o	k	u	m
f	o	-	k	-	-
f	-	o	ɡ	u	-
f	w	e	ɡ	o	-
f	-	ɔ	k	-	-
f	-	ø	-	-	-
f	-	œ	-	-	-
f	-	uː	k	-	-
f	w	ɔ	k	o	-

0.0194 (0.609)					
f	o	-	k	u	m
f	o	-	k	-	-
f	o	-	ɡ	u	-
f	w	e	ɡ	o	-
f	-	ɔ	k	-	-
f	-	ø	-	-	-
f	-	œ	-	-	-
f	-	uː	k	-	-
f	w	ɔ	k	o	-

0.0186 (0.627)					
f	-	-	o	k	u	m
f	-	-	o	k	-	-
f	-	-	o	ɡ	u	-
f	w	-	e	ɡ	o	-
f	-	-	ɔ	k	-	-
f	-	-	ø	-	-	-
f	-	-	œ	-	-	-
f	-	-	uː	k	-	-
f	-	w	ɔ	k	o	-

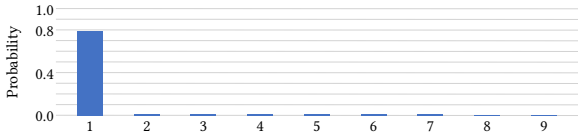
Five



	0.428	0.0330 (0.461)	0.0299 (0.491)	0.0280 (0.519)	0.0265 (0.546)
Latin	kʷ iː n kʷ - e	kʷ iː n kʷ - e	kʷ iː n kʷ - e	kʷ iː n kʷ - e -	kʷ iː n - kʷ e
Romanian	ʧ i n ʧ - -	ʧ i n ʧ - -	ʧ i n ʧ - -	ʧ i n ʧ - - -	ʧ i n - ʧ -
Portuguese	s - ĩ k - u	s ĩ - k - u	s - ĩ k - u	s - ĩ k - - u	s - ĩ k - u
Spanish	θ i n k - o	θ i n k - o	θ i n k - o	θ i n k - - o	θ i n k - o
Catalan	s i n k - -	s i n k - -	s i n k - -	s i n k - - -	s i n k - -
French	s - ɛ̃ k - -	s - ɛ̃ k - -	s ɛ̃ - k - -	s - ɛ̃ k - - -	s - ɛ̃ k - -
Walloon	s - ɛ̃ k - -	s - ɛ̃ k - -	s ɛ̃ - k - -	s - ɛ̃ k - - -	s - ɛ̃ k - -
Friulian	ʧ i n k - -	ʧ i n k - -	ʧ i n k - -	ʧ i n k - - -	ʧ i n k - -
Italian	ʧ i ŋ k w e	ʧ i ŋ k w e	ʧ i ŋ k w e	ʧ i ŋ k w e -	ʧ i ŋ k w e

	0.0200 (0.566)	0.0197 (0.585)	0.0194 (0.605)	0.0183 (0.623)
Latin	kʷ iː n - kʷ - e	kʷ iː n kʷ - e	kʷ iː n kʷ - - e	kʷ iː n kʷ - e
Romanian	ʧ i n ʧ - - -	ʧ i n - - ʧ	ʧ i n - ʧ - -	ʧ i n - ʧ -
Portuguese	s - ĩ k - - u	s - ĩ k - u	s - ĩ - k - u	s - ĩ k - u
Spanish	θ i n k - - o	θ i n k - o	θ i n - k - o	θ i n k - o
Catalan	s i n k - - -	s i n k - -	s i n - k - -	s i n k - -
French	s - ɛ̃ k - - -	s - ɛ̃ k - -	s - ɛ̃ - k - -	s - ɛ̃ k - -
Walloon	s - ɛ̃ k - - -	s - ɛ̃ k - -	s - ɛ̃ - k - -	s - ɛ̃ k - -
Friulian	ʧ i n k - - -	ʧ i n k - -	ʧ i n - k - -	ʧ i n k - -
Italian	ʧ i ŋ k - w e	ʧ i ŋ k w e	ʧ i ŋ - k w e	ʧ i ŋ k w e

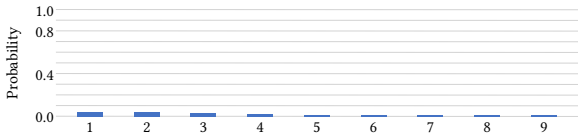
Flower

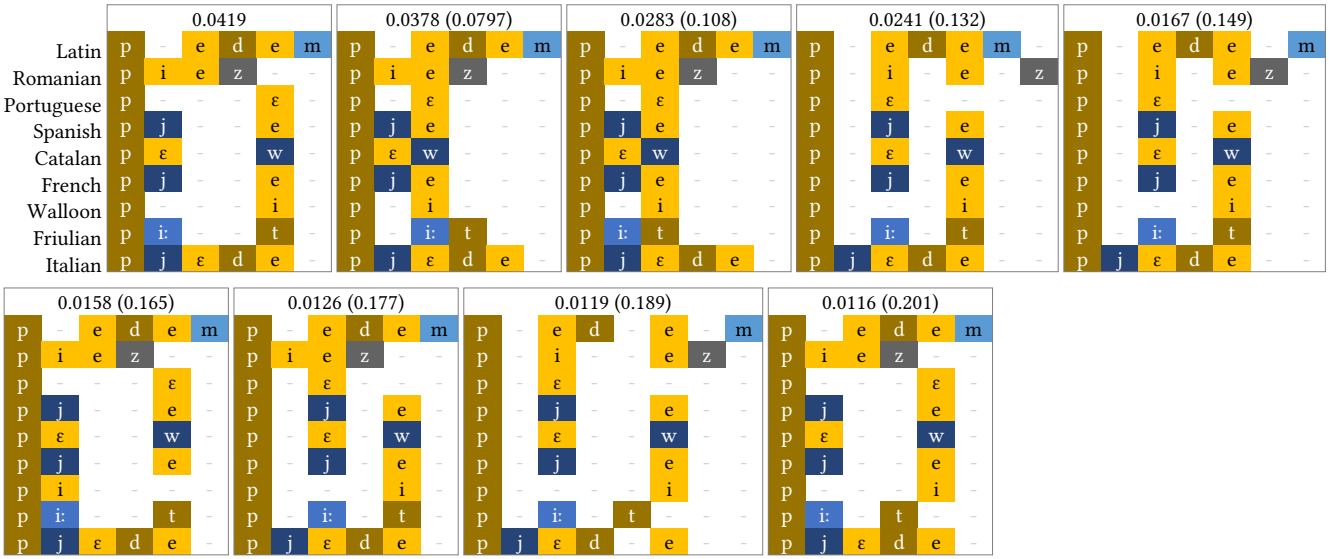


	0.789	0.0153 (0.804)	0.0147 (0.819)	0.0133 (0.832)
Latin	f l oː r e m	f l - oː r e m	f l oː r e m	f - l oː r e m
Romanian	f l o̯a r e -	f l - o̯a r e -	f l o̯a r e -	f - l o̯a r e -
Portuguese	f l o ɾ - -	f l - o ɾ - -	f l o ɾ - -	f - l o ɾ - -
Spanish	f l o ɾ - -	f l - o ɾ - -	f l o ɾ - -	f - l o ɾ - -
Catalan	f l ɔ - - -	f l - ɔ - - -	f l - ɔ - -	f - l ɔ - - -
French	f l œ ʁ - -	f l - œ ʁ - -	f l œ ʁ - -	f - l œ ʁ - -
Walloon	f l œ r - -	f l - œ r - -	f l œ r - -	f - l œ r - -
Friulian	f l oː r - -	f l - oː r - -	f l oː r - -	f - l oː r - -
Italian	f j o r e -	f - j o r e -	f j o r e -	f j - o r e -

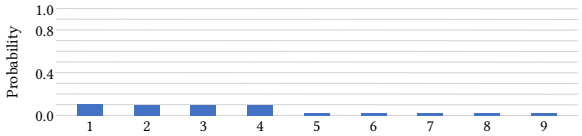
	0.0125 (0.844)	0.0120 (0.856)	0.0113 (0.868)	0.00903 (0.877)	0.00834 (0.885)
Latin	f l oː - r e m	f l - oː r e m	f l oː - r e m	f l - oː r e m	f l oː r - e m
Romanian	f l - o̯a r e -	f l o̯a - r e -	f l - o̯a r e -	f l o̯a - r e -	f l o̯a r e - -
Portuguese	f l - o ɾ - -	f l o - ɾ - -	f l o - ɾ - -	f l - o ɾ - -	f l o ɾ - - -
Spanish	f l - o ɾ - -	f l o - ɾ - -	f l o - ɾ - -	f l - o ɾ - -	f l o ɾ - - -
Catalan	f l - ɔ - - -	f l ɔ - - - -	f l ɔ - - -	f l - ɔ - - -	f l ɔ - - - -
French	f l - œ ʁ - -	f l œ - ʁ - -	f l œ - ʁ - -	f l - œ ʁ - -	f l œ ʁ - - -
Walloon	f l - œ r - -	f l œ - r - -	f l œ - r - -	f l - œ r - -	f l œ r - - -
Friulian	f l - oː r - -	f l oː - r - -	f l oː - r - -	f l - oː r - -	f l oː r - - -
Italian	f j - o r e -	f j o - r e -	f j o - r e -	f j - o r e -	f j o r e - -

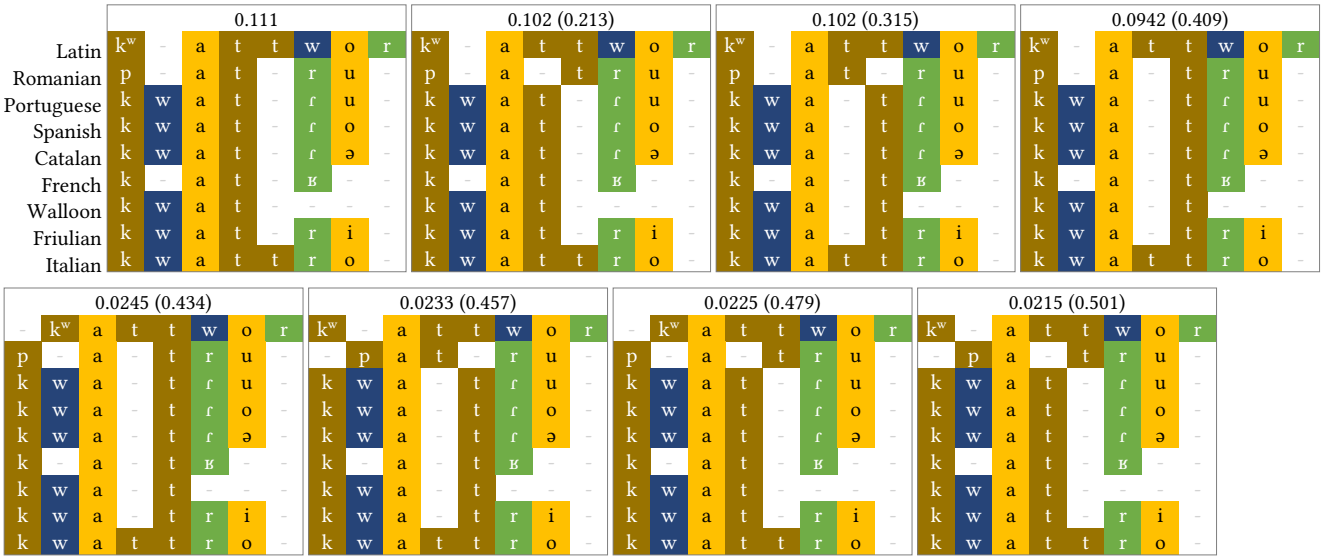
Foot


Probability
1.0
0.8
0.4
0.0
1 2 3 4 5 6 7 8 9


Latin
Romanian
Portuguese
Spanish
Catalan
French
Walloon
Friulian
Italian
0.0419
0.0378 (0.0797)
0.0283 (0.108)
0.0241 (0.132)
0.0167 (0.149)
0.0158 (0.165)
0.0126 (0.177)
0.0119 (0.189)
0.0116 (0.201)

Four

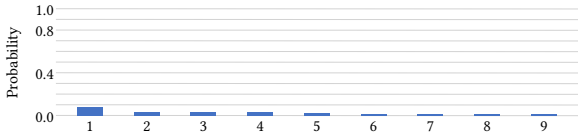

Probability
1.0
0.8
0.4
0.0
1 2 3 4 5 6 7 8 9


Latin
Romanian
Portuguese
Spanish
Catalan
French
Walloon
Friulian
Italian
0.111
0.102 (0.213)
0.102 (0.315)
0.0942 (0.409)
0.0245 (0.434)
0.0233 (0.457)
0.0225 (0.479)
0.0215 (0.501)

0.0215 (0.522)

-	kʷ	a	t	t	w	o	r
p	-	a	t	-	r	u	-
k	w	a	t	-	ɾ	u	-
k	w	a	t	-	ɾ	o	-
k	w	a	t	-	ɾ	ə	-
k	-	a	t	-	ʁ	-	-
k	w	a	t	-	-	-	-
k	w	a	t	-	r	i	-
k	w	a	t	t	r	o	-

Fruit



0.0755

Latin	f	r	uː	k	-	t	u	m
Romanian	f	r	u	k	-	t	-	-
Portuguese	f	ɾ	u	-	-	t	ɐ	-
Spanish	f	ɾ	u	-	-	t	o	-
Catalan	f	ɾ	u	-	j	t	-	-
French	f	ʁ	ɥ	-	-	i	-	-
Walloon	f	r	y	-	-	t	-	-
Friulian	f	r	u	-	-	t	-	-
Italian	f	r	u	t	-	t	o	-

0.0340 (0.109)

Latin	f	r	uː	-	k	t	u	m
Romanian	f	r	u	-	k	t	-	-
Portuguese	f	ɾ	u	-	-	t	ɐ	-
Spanish	f	ɾ	u	-	-	t	o	-
Catalan	f	ɾ	u	j	-	t	-	-
French	f	ʁ	ɥ	-	-	i	-	-
Walloon	f	r	y	-	-	t	-	-
Friulian	f	r	u	-	-	t	-	-
Italian	f	r	u	-	t	t	o	-

0.0310 (0.140)

Latin	f	r	-	uː	k	t	u	m
Romanian	f	r	-	u	k	t	-	-
Portuguese	f	ɾ	-	u	-	t	ɐ	-
Spanish	f	ɾ	-	u	-	t	o	-
Catalan	f	ɾ	-	u	j	t	-	-
French	f	ʁ	ɥ	i	-	-	-	-
Walloon	f	r	-	y	-	t	-	-
Friulian	f	r	-	u	-	t	-	-
Italian	f	r	-	u	t	t	o	-

0.0295 (0.170)

Latin	f	r	uː	k	-	t	u	m
Romanian	f	r	u	k	-	t	-	-
Portuguese	f	ɾ	u	-	-	t	ɐ	-
Spanish	f	ɾ	u	-	-	t	o	-
Catalan	f	ɾ	u	-	j	t	-	-
French	f	ʁ	ɥ	-	-	-	i	-
Walloon	f	r	y	-	-	t	-	-
Friulian	f	r	u	-	-	t	-	-
Italian	f	r	u	t	-	t	o	-

0.0205 (0.190)

Latin	f	r	uː	k	-	t	u	m
Romanian	f	r	u	k	-	t	-	-
Portuguese	f	ɾ	u	-	-	t	ɐ	-
Spanish	f	ɾ	u	-	-	t	o	-
Catalan	f	ɾ	u	-	j	t	-	-
French	f	ʁ	ɥ	-	i	-	-	-
Walloon	f	r	y	-	-	t	-	-
Friulian	f	r	u	-	-	t	-	-
Italian	f	r	u	t	-	t	o	-

0.0179 (0.208)

Latin	f	r	uː	-	k	t	u	m
Romanian	f	r	u	-	k	t	-	-
Portuguese	f	ɾ	u	-	-	t	ɐ	-
Spanish	f	ɾ	u	-	-	t	o	-
Catalan	f	ɾ	u	j	-	t	-	-
French	f	ʁ	ɥ	i	-	-	-	-
Walloon	f	r	-	y	-	t	-	-
Friulian	f	r	u	-	-	t	-	-
Italian	f	r	u	-	t	t	o	-

0.0177 (0.226)

Latin	f	r	-	uː	k	-	t	u	m
Romanian	f	r	-	u	k	-	t	-	-
Portuguese	f	ɾ	-	u	-	-	t	ɐ	-
Spanish	f	ɾ	-	u	-	-	t	o	-
Catalan	f	ɾ	-	u	-	j	t	-	-
French	f	ʁ	ɥ	i	-	-	-	-	-
Walloon	f	r	-	y	-	-	t	-	-
Friulian	f	r	-	u	-	-	t	-	-
Italian	f	r	-	u	t	-	t	o	-

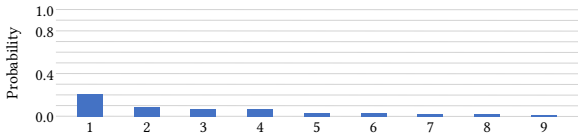
0.0170 (0.243)

Latin	f	r	uː	k	t	u	m	
Romanian	f	r	u	k	t	-	-	
Portuguese	f	ɾ	u	-	t	ɐ	-	
Spanish	f	ɾ	u	-	t	o	-	
Catalan	f	ɾ	u	j	t	-	-	
French	f	ʁ	ɥ	-	i	-	-	
Walloon	f	r	y	-	t	-	-	
Friulian	f	r	u	-	t	-	-	
Italian	f	r	u	t	t	o	-	

0.0163 (0.259)

Latin	f	r	uː	-	k	t	u	m
Romanian	f	r	u	-	k	t	-	-
Portuguese	f	ɾ	u	-	t	-	ɐ	-
Spanish	f	ɾ	u	-	t	-	o	-
Catalan	f	ɾ	u	j	t	-	-	-
French	f	ʁ	ɥ	-	i	-	-	-
Walloon	f	r	y	-	t	-	-	-
Friulian	f	r	u	-	t	-	-	-
Italian	f	r	u	-	t	t	o	-

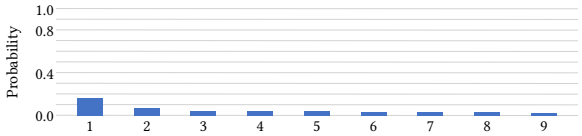
Full



	0.211						0.0875 (0.298)						0.0663 (0.365)						0.0657 (0.430)						0.0341 (0.464)					
Latin	p	l	eː	n	u	m	p	l	eː	n	u	m	p	l	eː	n	u	m	p	l	eː	n	u	m	p	l	eː	n	u	m
Romanian	p	l	i	n	-	-	p	l	i	n	-	-	p	l	i	n	-	-	p	l	i	n	-	-	p	l	i	n	-	-
Portuguese	ʃ	-	ɐj	-	u	-	ʃ	ɐj	-	-	u	-	ʃ	-	ɐj	-	u	-	-	ʃ	ɐj	-	u	-	ʃ	-	ɐj	-	u	-
Spanish	ʝ	-	e	n	o	-	ʝ	e	-	n	o	-	ʝ	-	e	n	o	-	-	ʝ	e	n	o	-	ʝ	-	e	n	o	-
Catalan	p	l	ɛ	-	-	-	p	l	-	-	ɛ	-	p	l	-	-	ɛ	-	p	l	ɛ	-	-	-	p	l	ɛ	-	-	-
French	p	l	ɛ̃	-	-	-	p	l	-	-	ɛ̃	-	p	l	-	-	ɛ̃	-	p	l	ɛ̃	-	-	-	p	l	-	ɛ̃	-	-
Walloon	p	l	ɛ̃	-	-	-	p	l	-	-	ɛ̃	-	p	l	-	-	ɛ̃	-	p	l	ɛ̃	-	-	-	p	l	-	ɛ̃	-	-
Friulian	p	l	ɛ	n	-	-	p	l	ɛ	n	-	-	p	l	ɛ	n	-	-	p	l	ɛ	n	-	-	p	l	ɛ	n	-	-
Italian	p	j	ɛ	n	o	-	p	j	ɛ	n	o	-	p	j	ɛ	n	o	-	p	j	ɛ	n	o	-	p	j	ɛ	n	o	-

	0.0290 (0.493)						0.0249 (0.518)						0.0195 (0.538)						0.0142 (0.552)					
Latin	p	l	eː	n	u	m	p	l	eː	n	u	m	p	l	eː	n	u	m	p	l	eː	n	u	m
Romanian	p	l	i	n	-	-	p	l	i	n	-	-	p	l	i	n	-	-	p	l	i	n	-	-
Portuguese	ʃ	ɐj	-	-	u	-	ʃ	-	ɐj	-	u	-	-	ʃ	ɐj	-	u	-	-	ʃ	ɐj	-	u	-
Spanish	ʝ	e	-	n	o	-	ʝ	-	e	n	o	-	-	ʝ	e	n	o	-	-	ʝ	e	n	o	-
Catalan	p	l	-	ɛ	-	-	p	l	-	ɛ	-	-	p	l	-	-	ɛ	-	p	l	ɛ	-	-	-
French	p	l	-	ɛ̃	-	-	p	l	-	ɛ̃	-	-	p	l	-	-	ɛ̃	-	p	l	-	ɛ̃	-	-
Walloon	p	l	-	ɛ̃	-	-	p	l	-	ɛ̃	-	-	p	l	-	-	ɛ̃	-	p	l	-	ɛ̃	-	-
Friulian	p	l	ɛ	n	-	-	p	l	ɛ	n	-	-	p	l	ɛ	n	-	-	p	l	ɛ	n	-	-
Italian	p	j	ɛ	n	o	-	p	j	ɛ	n	o	-	p	j	ɛ	n	o	-	p	j	ɛ	n	o	-

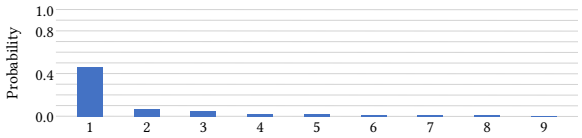
Good



	0.159						0.0657 (0.225)						0.0455 (0.271)						0.0385 (0.309)						0.0378 (0.347)					
Latin	b	-	o	n	u	m	b	-	o	n	u	m	b	-	-	o	n	u	m	b	o	-	n	u	m	b	-	-	o	n	u	m
Romanian	b	-	u	n	-	-	b	-	u	n	-	-	b	-	-	u	n	-	-	b	-	u	n	-	-	b	-	-	u	n	-	-
Portuguese	b	-	-	õ	-	-	b	-	-	õ	-	-	b	-	-	-	õ	-	-	b	-	-	õ	-	-	b	-	-	-	õ	-	-
Spanish	b	w	e	n	o	-	b	w	e	n	o	-	b	-	w	e	n	o	-	b	w	e	n	o	-	b	w	-	e	n	o	-
Catalan	b	-	ɔ	-	-	-	b	-	-	-	ɔ	-	b	-	-	ɔ	-	-	-	b	-	ɔ	-	-	-	b	-	-	ɔ	-	-	-
French	b	-	ɔ̃	-	-	-	b	-	-	-	ɔ̃	-	b	-	-	ɔ̃	-	-	-	b	-	ɔ̃	-	-	-	b	-	-	ɔ̃	-	-	-
Walloon	b	-	ɔ̃	-	-	-	b	-	-	-	ɔ̃	-	b	-	-	ɔ̃	-	-	-	b	-	ɔ̃	-	-	-	b	-	-	ɔ̃	-	-	-
Friulian	b	-	ɔ	n	-	-	b	-	ɔ	n	-	-	b	-	-	ɔ	n	-	-	b	-	ɔ	n	-	-	b	-	-	ɔ	n	-	-
Italian	b	w	ɔ	n	o	-	b	w	ɔ	n	o	-	b	w	-	ɔ	n	o	-	b	w	ɔ	n	o	-	b	-	w	ɔ	n	o	-

	0.0342 (0.381)						0.0318 (0.413)						0.0286 (0.441)						0.0225 (0.464)					
Latin	b	-	o	n	u	m	b	-	o	n	u	m	b	o	-	n	u	m	b	-	o	n	u	m
Romanian	b	-	u	n	-	-	b	u	-	n	-	-	b	u	-	n	-	-	b	-	u	n	-	-
Portuguese	b	-	-	õ	-	-	b	-	-	õ	-	-	b	-	-	õ	-	-	b	-	-	õ	-	-
Spanish	b	w	e	n	o	-	b	w	e	n	o	-	b	w	e	n	o	-	b	w	e	n	o	-
Catalan	b	-	-	ɔ	-	-	b	-	ɔ	-	-	-	b	-	ɔ	-	-	-	b	-	ɔ	-	-	-
French	b	-	-	ɔ̃	-	-	b	-	ɔ̃	-	-	-	b	-	ɔ̃	-	-	-	b	-	-	ɔ̃	-	-
Walloon	b	-	-	ɔ̃	-	-	b	-	ɔ̃	-	-	-	b	-	ɔ̃	-	-	-	b	-	-	ɔ̃	-	-
Friulian	b	-	ɔ	n	-	-	b	-	ɔ	n	-	-	b	-	ɔ	n	-	-	b	-	ɔ	n	-	-
Italian	b	w	ɔ	n	o	-	b	w	ɔ	n	o	-	b	w	ɔ	n	o	-	b	w	ɔ	n	o	-

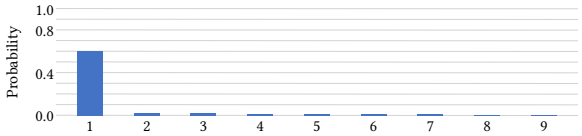
Grass



	0.467	0.0719 (0.539)	0.0545 (0.593)	0.0255 (0.619)	0.0242 (0.643)
Latin	h e r b a m	h e r b a m	h e r b a m	h e r b a m	h e r b a m
Romanian	j a r b ə -	j a r b ə -	j a r b ə -	j a r b ə -	j a r b ə -
Portuguese	- ɛ ɾ v ɐ -	- ɛ ɾ v ɐ -	- ɛ ɾ v ɐ -	- ɛ ɾ v ɐ -	ɛ - ɾ v ɐ -
Spanish	j e ɾ b a -	j e ɾ b a -	j e ɾ b a -	j e ɾ b a -	j e ɾ b a -
Catalan	- e ɾ b ə -	e - ɾ b ə -	- e ɾ b ə -	- e ɾ b ə -	- e ɾ b ə -
French	- ɛ ʁ b - -	- ɛ ʁ b - -	- ɛ ʁ b - -	- ɛ ʁ b - -	- ɛ ʁ b - -
Walloon	j ɛ - p - -	j ɛ - p - -	- j ɛ p - -	j ɛ p - - -	j ɛ - p - -
Friulian	j e r b e -	j e r b e -	j e r b e -	j e r b e -	j e r b e -
Italian	- ɛ r b a -	- ɛ r b a -	- ɛ r b a -	- ɛ r b a -	- ɛ r b a -

0.0177 (0.661)	0.0150 (0.676)	0.0114 (0.687)	0.00866 (0.696)
h e r b a m	h - e r b a m	- h e r b a m	h e r b a m
j a r b ə -	- j a r b ə -	j - a r b ə -	j a r b ə -
- ɛ ɾ v ɐ -	- - ɛ ɾ v ɐ -	- - ɛ ɾ v ɐ -	- ɛ ɾ v ɐ -
j e ɾ b a -	- j e ɾ b a -	j - e ɾ b a -	j e ɾ b a -
- e ɾ b ə -	- - e ɾ b ə -	- - e ɾ b ə -	e - ɾ b ə -
- ɛ ʁ b - -	- - ɛ ʁ b - -	- - ɛ ʁ b - -	ɛ - ʁ b - -
j ɛ - p - -	- j ɛ - p - -	j - ɛ - p - -	j - ɛ p - -
j e r b e -	- j e r b e -	j - e r b e -	j e r b e -
ɛ - r b a -	- - ɛ r b a -	- - ɛ r b a -	- ɛ r b a -

Green

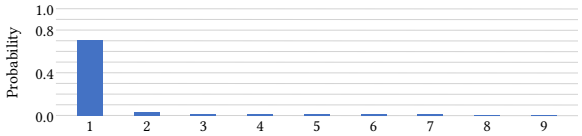


	0.600	0.0218 (0.622)	0.0205 (0.643)	0.0163 (0.659)
Latin	w i r i d e m	w i r i d e m	w i r i d e m	- w i r i d e m
Romanian	v e r - d e -	v e r - d e -	v e r - d e -	v - e r - d e -
Portuguese	v e ɾ - d ɨ -	v e ɾ - d ɨ -	v e ɾ - d ɨ -	v - e ɾ - d ɨ -
Spanish	b e ɾ - d e -	b e ɾ - d e -	b e ɾ - d e -	b - e ɾ - d e -
Catalan	b ɛ ɾ - t - -	b ɛ ɾ - - t -	b ɛ ɾ - t - -	b - ɛ ɾ - t - -
French	v ɛ ʁ - - - -	v ɛ ʁ - - - -	v ɛ ʁ - - - -	v - ɛ ʁ - - - -
Walloon	v e r - - - -	v e r - - - -	v e r - - - -	v - e r - - - -
Friulian	v ɛ r - t - -	v ɛ r - t - -	v ɛ r - - t -	v - ɛ r - t - -
Italian	v e r - d e -	v e r - d e -	v e r - d e -	v - e r - d e -

0.0138 (0.673)	0.0116 (0.684)	0.0106 (0.695)	0.00849 (0.703)
w - i r i d e m	w i - r i d e m	w i r i d e m -	- w i r i d e m
- v e r - d e -	v - e r - d e -	v e r - d e - -	- v e r - d e -
- v e ɾ - d ɨ -	v - e ɾ - d ɨ -	v e ɾ - d ɨ - -	- v e ɾ - d ɨ -
- b e ɾ - d e -	b - e ɾ - d e -	b e ɾ - d e - -	b - e ɾ - d e -
- b ɛ ɾ - t - -	b - ɛ ɾ - t - -	b ɛ ɾ - - - - t	- b ɛ ɾ - t - -
- v ɛ ʁ - - - -	v - ɛ ʁ - - - -	v ɛ ʁ - - - - -	- v ɛ ʁ - - - -
- v e r - - - -	v - e r - - - -	v e r - - - - -	- v e r - - - -
- v ɛ r - t - -	v - ɛ r - t - -	v ɛ r - t - - -	- v ɛ r - t - -
- v e r - d e -	v - e r - d e -	v e r - d e - -	- v e r - d e -

0.00803 (0.711)						
w	i	r	i	d	e	m
v	e	r	-	d	e	-
v	e	ɾ	-	d	ɨ	-
b	e	ɾ	-	d	e	-
b	ɛ	ɾ	-	t	-	-
v	ɛ	-	-	ʁ	-	-
v	e	-	-	r	-	-
v	ɛ	r	-	t	-	-
v	e	r	-	d	e	-

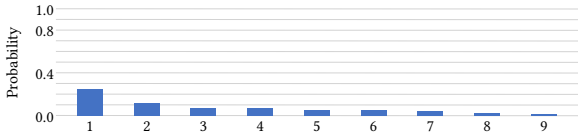
Head



	0.711					0.0360 (0.747)					0.0119 (0.759)					0.0115 (0.771)					0.0104 (0.781)				
Latin	k	a	p	u	t	k	a	p	u	t	k	a	p	u	-	t	k	a	p	-	u	t	k	a	p	u	t
Romanian	k	a	p	-	-	k	a	p	-	-	k	a	p	-	-	-	k	a	p	-	-	-	k	a	p	-	-
Portuguese	k	a	b	u	-	k	a	b	u	-	k	a	b	-	u	-	k	a	b	u	-	-	k	a	b	-	-
Spanish	k	a	b	o	-	k	a	b	o	-	k	a	b	-	o	-	k	a	b	o	-	-	k	a	b	-	-
Catalan	k	a	p	-	-	k	a	p	-	-	k	a	p	-	-	-	k	a	p	-	-	-	k	a	p	-	-
French	ʃ	ɛ	f	-	-	ʃ	ɛ	f	-	-	ʃ	ɛ	f	-	-	-	ʃ	ɛ	f	-	-	-	ʃ	ɛ	f	-	-
Walloon	ʧ	i:	f	-	-	ʧ	i:	f	-	-	ʧ	i:	f	-	-	-	ʧ	i:	f	-	-	-	ʧ	i:	f	-	-
Friulian	c	a:	f	-	-	c	a:	-	f	-	c	a:	f	-	-	-	c	a:	f	-	-	-	c	a:	f	-	-
Italian	k	a	p	o	-	k	a	p	o	-	k	a	p	-	o	-	k	a	p	o	-	-	k	a	p	-	o

0.00986 (0.791)						0.00957 (0.800)						0.00863 (0.809)						0.00814 (0.817)					
k	-	a	p	u	t	k	a	p	-	u	t	k	a	-	p	u	t	-	k	a	p	u	t
k	-	a	p	-	-	k	a	p	-	-	-	k	a	-	p	-	-	-	k	a	p	-	-
k	-	a	b	u	-	k	a	-	b	u	-	k	a	b	-	u	-	-	k	a	b	u	-
k	-	a	b	o	-	k	a	-	b	o	-	k	a	b	-	o	-	-	k	a	b	o	-
k	-	a	p	-	-	k	a	-	p	-	-	k	a	p	-	-	-	-	k	a	p	-	-
ʃ	-	ɛ	f	-	-	ʃ	ɛ	-	f	-	-	ʃ	ɛ	f	-	-	-	-	ʃ	ɛ	f	-	-
ʧ	-	i:	f	-	-	ʧ	i:	-	f	-	-	ʧ	i:	f	-	-	-	-	ʧ	i:	f	-	-
-	c	a:	f	-	-	c	a:	-	f	-	-	c	a:	f	-	-	-	c	-	a:	f	-	-
k	-	a	p	o	-	k	a	p	-	o	-	k	a	-	p	o	-	-	k	a	p	o	-

I

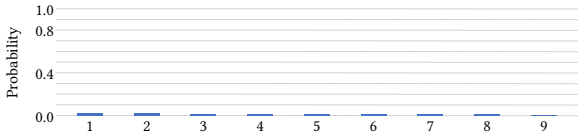


	0.249				0.112 (0.361)				0.0745 (0.436)				0.0673 (0.503)				0.0502 (0.553)				0.0487 (0.602)				0.0417 (0.643)				0.0200 (0.663)			
Latin	e	g	o:	-	e	g	o:	-	-	e	g	o:	e	g	-	o:	e	-	g	o:	-	e	g	o:	-	e	g	o:	e	g	-	o:
Romanian	j	-	e	w	-	j	e	w	j	e	-	w	j	-	e	w	j	e	-	w	j	e	-	w	j	e	-	w	-	j	e	w
Portuguese	e	-	w	-	-	e	w	-	e	-	-	w	e	-	-	w	e	-	-	w	-	e	-	w	e	w	-	-	-	e	-	w
Spanish	j	-	o	-	-	j	o	-	j	-	-	o	j	-	-	o	j	-	-	o	-	j	-	o	j	o	-	-	-	j	-	o
Catalan	ʒ	-	ɔ	-	-	ʒ	ɔ	-	ʒ	-	-	ɔ	ʒ	-	-	ɔ	ʒ	-	-	ɔ	-	ʒ	-	ɔ	ʒ	ɔ	-	-	-	ʒ	-	ɔ
French	ʒ	-	ə	-	-	ʒ	ə	-	ʒ	-	-	ə	ʒ	-	-	ə	ʒ	-	-	ə	-	ʒ	-	ə	ʒ	ə	-	-	-	ʒ	-	ə
Walloon	ʤ	-	i	-	-	ʤ	i	-	ʤ	-	-	i	ʤ	-	-	i	ʤ	-	-	i	-	ʤ	-	i	ʤ	i	-	-	-	ʤ	-	i
Friulian	j	-	o	-	-	j	o	-	j	-	-	o	j	-	-	o	j	-	-	o	-	j	-	o	j	o	-	-	-	j	-	o
Italian	i	-	o	-	-	i	o	-	i	-	-	o	i	-	-	o	i	-	-	o	-	i	-	o	i	o	-	-	-	i	-	o

0.0115 (0.675)

e	g	oː
j	e	w
e	w	-
j	o	-
ʒ	ɔ	-
ʒ	ə	-
ʤ	i	-
j	o	-
i	o	-

Knee



0.0260

Latin	g	e	n	i	-	-	k	u	l	u	m
Romanian	ʤ	e	n	u	-	n	kʲ	-	-	-	-
Portuguese	ʒ	u	-	ɐ	-	-	-	-	ʎ	u	-
Spanish	-	i	n	o	-	-	-	-	x	o	-
Catalan	ʒ	ə	n	o	-	-	-	-	ʎ	-	-
French	ʒ	ə	n	u	-	-	-	-	-	-	-
Walloon	ɲ	-	ɲ	ɔ	-	-	-	-	-	-	-
Friulian	ʤ	e	n	o	-	-	-	-	l	i	-
Italian	ʤ	i	n	ɔ	k	-	k	-	j	o	-

0.0226 (0.0486)

Latin	g	e	n	i	-	-	k	u	l	u	m
Romanian	ʤ	e	n	u	n	-	kʲ	-	-	-	-
Portuguese	ʒ	u	-	ɐ	-	-	-	-	ʎ	u	-
Spanish	-	i	n	o	-	-	-	-	x	o	-
Catalan	ʒ	ə	n	o	-	-	-	-	ʎ	-	-
French	ʒ	ə	n	u	-	-	-	-	-	-	-
Walloon	ɲ	-	ɲ	ɔ	-	-	-	-	-	-	-
Friulian	ʤ	e	n	o	-	-	-	-	l	i	-
Italian	ʤ	i	n	ɔ	-	k	k	-	j	o	-

0.0157 (0.0643)

Latin	g	e	n	i	-	k	-	u	l	u	m
Romanian	ʤ	e	n	u	n	kʲ	-	-	-	-	-
Portuguese	ʒ	u	-	ɐ	-	-	-	-	ʎ	u	-
Spanish	-	i	n	o	-	-	-	-	x	o	-
Catalan	ʒ	ə	n	o	-	-	-	-	ʎ	-	-
French	ʒ	ə	n	u	-	-	-	-	-	-	-
Walloon	ɲ	-	ɲ	ɔ	-	-	-	-	-	-	-
Friulian	ʤ	e	n	o	-	-	-	-	l	i	-
Italian	ʤ	i	n	ɔ	-	k	k	-	j	o	-

0.0147 (0.0790)

Latin	g	e	n	i	-	k	-	u	l	u	m
Romanian	ʤ	e	n	u	n	kʲ	-	-	-	-	-
Portuguese	ʒ	u	-	ɐ	-	-	-	-	ʎ	u	-
Spanish	-	i	n	o	-	-	-	-	x	o	-
Catalan	ʒ	ə	n	o	-	-	-	-	ʎ	-	-
French	ʒ	ə	n	u	-	-	-	-	-	-	-
Walloon	-	ɲ	ɲ	ɔ	-	-	-	-	-	-	-
Friulian	ʤ	e	n	o	-	-	-	-	l	i	-
Italian	ʤ	i	n	ɔ	-	k	k	-	j	o	-

0.0110 (0.0900)

Latin	g	e	n	i	k	u	l	u	m		
Romanian	ʤ	e	n	u	n	kʲ	-	-	-		
Portuguese	ʒ	u	-	ɐ	-	-	ʎ	u	-		
Spanish	-	i	n	o	-	-	x	o	-		
Catalan	ʒ	ə	n	o	-	-	ʎ	-	-		
French	ʒ	ə	n	u	-	-	-	-	-		
Walloon	ɲ	-	ɲ	ɔ	-	-	-	-	-		
Friulian	ʤ	e	n	o	-	-	l	i	-		
Italian	ʤ	i	n	ɔ	k	k	j	o	-		

0.0101 (0.100)

Latin	g	e	n	i	-	k	u	-	l	u	m
Romanian	ʤ	e	n	u	n	kʲ	-	-	-	-	-
Portuguese	ʒ	u	-	ɐ	-	-	-	-	ʎ	u	-
Spanish	-	i	n	o	-	-	-	-	x	o	-
Catalan	ʒ	ə	n	o	-	-	-	-	ʎ	-	-
French	ʒ	ə	n	u	-	-	-	-	-	-	-
Walloon	ɲ	-	ɲ	ɔ	-	-	-	-	-	-	-
Friulian	ʤ	e	n	o	-	-	-	-	l	i	-
Italian	ʤ	i	n	ɔ	-	k	-	k	j	o	-

0.00991 (0.110)

Latin	g	e	n	i	-	-	k	u	l	u	m
Romanian	ʤ	e	n	u	n	-	kʲ	-	-	-	-
Portuguese	ʒ	u	-	ɐ	-	-	-	-	ʎ	u	-
Spanish	-	i	n	o	-	-	-	-	x	o	-
Catalan	ʒ	ə	n	o	-	-	-	-	ʎ	-	-
French	ʒ	ə	n	u	-	-	-	-	-	-	-
Walloon	-	ɲ	ɲ	ɔ	-	-	-	-	-	-	-
Friulian	ʤ	e	n	o	-	-	-	-	l	i	-
Italian	ʤ	i	n	ɔ	-	k	k	-	j	o	-

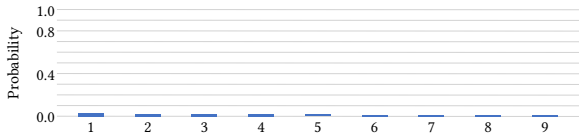
0.00943 (0.119)

Latin	g	e	n	i	-	k	u	-	l	u	m
Romanian	ʤ	e	n	u	n	kʲ	-	-	-	-	-
Portuguese	ʒ	u	-	ɐ	-	-	-	-	ʎ	u	-
Spanish	-	i	n	o	-	-	-	-	x	o	-
Catalan	ʒ	ə	n	o	-	-	-	-	ʎ	-	-
French	ʒ	ə	n	u	-	-	-	-	-	-	-
Walloon	-	ɲ	ɲ	ɔ	-	-	-	-	-	-	-
Friulian	ʤ	e	n	o	-	-	-	-	l	i	-
Italian	ʤ	i	n	ɔ	-	k	-	k	j	o	-

0.00889 (0.128)

Latin	g	e	n	i	-	k	-	u	l	u	m
Romanian	ʤ	e	n	u	n	-	kʲ	-	-	-	-
Portuguese	ʒ	u	-	ɐ	-	-	-	-	ʎ	u	-
Spanish	-	i	n	o	-	-	-	-	x	o	-
Catalan	ʒ	ə	n	o	-	-	-	-	ʎ	-	-
French	ʒ	ə	n	u	-	-	-	-	-	-	-
Walloon	-	ɲ	ɲ	ɔ	-	-	-	-	-	-	-
Friulian	ʤ	e	n	o	-	-	-	-	l	i	-
Italian	ʤ	i	n	ɔ	-	k	k	-	j	o	-

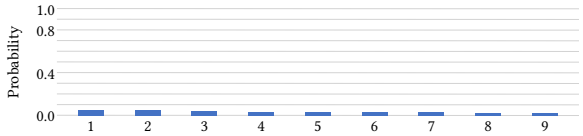
Leaf



	0.0314	0.0227 (0.0541)	0.0213 (0.0754)	0.0195 (0.0949)	0.0184 (0.113)
Latin	f o l i - a	f - o l i - a	f o l i a	f o l i - a	f o l i a
Romanian	f ɑ̯a j - - e	f - ɑ̯a j - - e	f ɑ̯a - j e	f ɑ̯a j - - e	f ɑ̯a - j e
Portuguese	f o ɣ - - ɐ	f - o ɣ - - ɐ	f o ɣ - ɐ	f o ɣ - - ɐ	f o - ɣ ɐ
Spanish	- o x - - a	- - o x - - a	- o x - a	- o x - - a	- o - x a
Catalan	f u ɣ - - ə	f - u ɣ - - ə	f u ɣ - ə	f u ɣ - - ə	f u - ɣ ə
French	f œ j - - -	f - œ - - - j	f œ - - j	f œ - - - j	f œ - j -
Walloon	f ɔj - - - -	f - ɔj - - - -	f ɔj - - -	f ɔj - - - -	f ɔj - - -
Friulian	f w e - - e	f w e - - - e	f w e - e	f w e - - e	f w - e e
Italian	f ɔ ɣ - ɣ a	f - ɔ ɣ - ɣ a	f ɔ ɣ ɣ a	f ɔ ɣ - ɣ a	f ɔ ɣ ɣ a

	0.0177 (0.131)	0.0157 (0.147)	0.0145 (0.161)	0.0127 (0.174)
Latin	f o l - i a	f o l i a	f o l - i a	f o l i a
Romanian	f ɑ̯a j - - e	f ɑ̯a - j e	f ɑ̯a j - - e	f ɑ̯a - j e
Portuguese	f o ɣ - - ɐ	f o - ɣ ɐ	f o ɣ - - ɐ	f o ɣ - ɐ
Spanish	- o x - - a	- o - x a	- o x - - a	- o x - a
Catalan	f u ɣ - - ə	f u - ɣ ə	f u ɣ - - ə	f u ɣ - ə
French	f œ j - - -	f œ - - j	f œ - - - j	f œ j - -
Walloon	f ɔj - - - -	f ɔj - - -	f ɔj - - - -	f ɔj - - -
Friulian	f w e - - e	f w - e e	f w e - - e	f w e - e
Italian	f ɔ ɣ ɣ - a	f ɔ ɣ ɣ a	f ɔ ɣ ɣ - a	f ɔ ɣ ɣ a

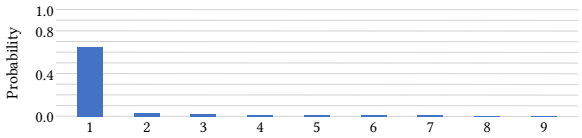
Liver

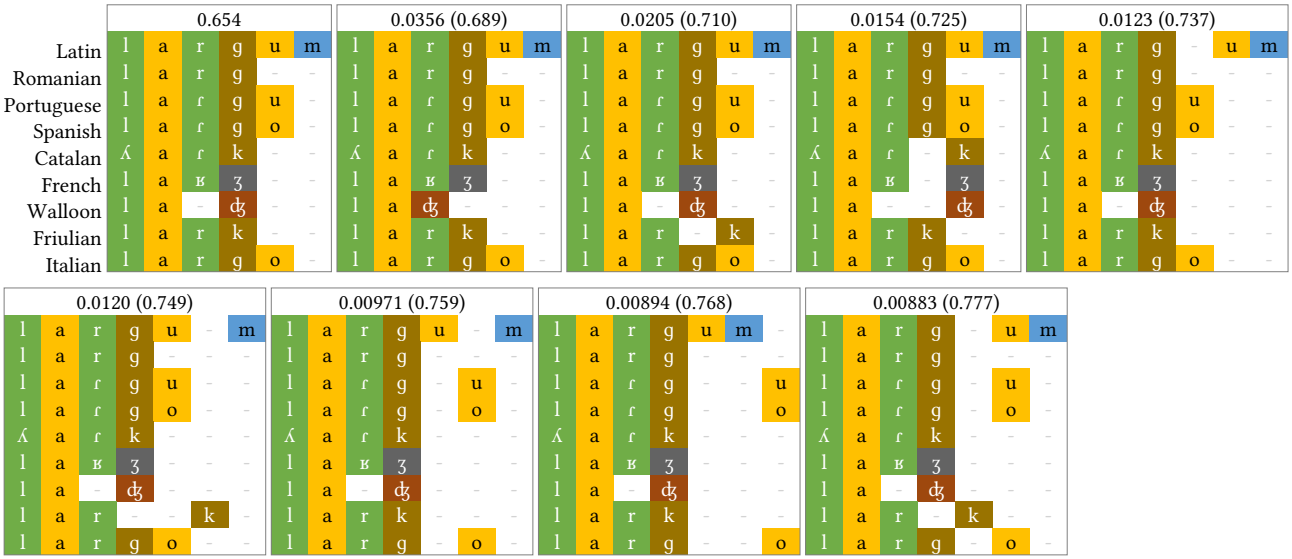


	0.0476	0.0471 (0.0947)	0.0393 (0.134)	0.0335 (0.167)
Latin	f iː k aː t u m	f iː k aː t u m	f iː k aː t u m	f iː k aː t u m
Romanian	f i k a t - -	f i k a t - -	f i k a t - -	f i k a t - -
Portuguese	f i g ɐ d u -	f i g ɐ d u -	f i g ɐ d u -	f i g ɐ d u -
Spanish	- i g a d o -	- i g a d o -	- i g a d o -	- i g a d o -
Catalan	f e ʤ ə - - -	f e ʤ ə - - -	f e - - ʤ ə -	f e - - ʤ ə -
French	f w - a - - -	f w - a - - -	f w - - - a -	f w - - a - -
Walloon	f œ t - - - -	f œ - t - - -	f œ - - t - -	f œ - - t - -
Friulian	f i - aː t - -	f i - aː t - -	f i - aː t - -	f i - aː t - -
Italian	f e g a t o -	f e g a t o -	f e g a t o -	f e g a t o -

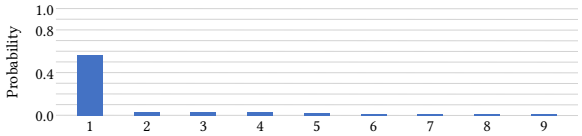
	0.0314 (0.199)	0.0304 (0.229)	0.0296 (0.259)	0.0263 (0.285)	0.0209 (0.306)
Latin	f iː k aː t u m	f iː k aː t u m	f iː k aː t u m	f iː k aː t u m	f iː k aː t u m
Romanian	f i k a t - -	f i k a t - -	f i k a t - -	f i k a t - -	f i k a t - -
Portuguese	f i g ɐ d u -	f i g ɐ d u -	f i g ɐ d u -	f i g ɐ d u -	f i g ɐ d u -
Spanish	- i g a d o -	- i g a d o -	- i g a d o -	- i g a d o -	- i g a d o -
Catalan	f e ʤ ə - - -	f - - e ʤ ə -	f - - e ʤ ə -	f e ʤ ə - - -	f e - - ʤ ə -
French	f w a - - - -	f - - w - a -	f - - w a - -	f - w a - - -	f w - a - - -
Walloon	f œ t - - - -	f - - œ t - -	f - - œ t - -	f œ t - - -	f - - œ t - -
Friulian	f i - aː t - -	f i - aː t - -	f i - aː t - -	f i - aː t - -	f i - aː t - -
Italian	f e g a t o -	f e g a t o -	f e g a t o -	f e g a t o -	f e g a t o -

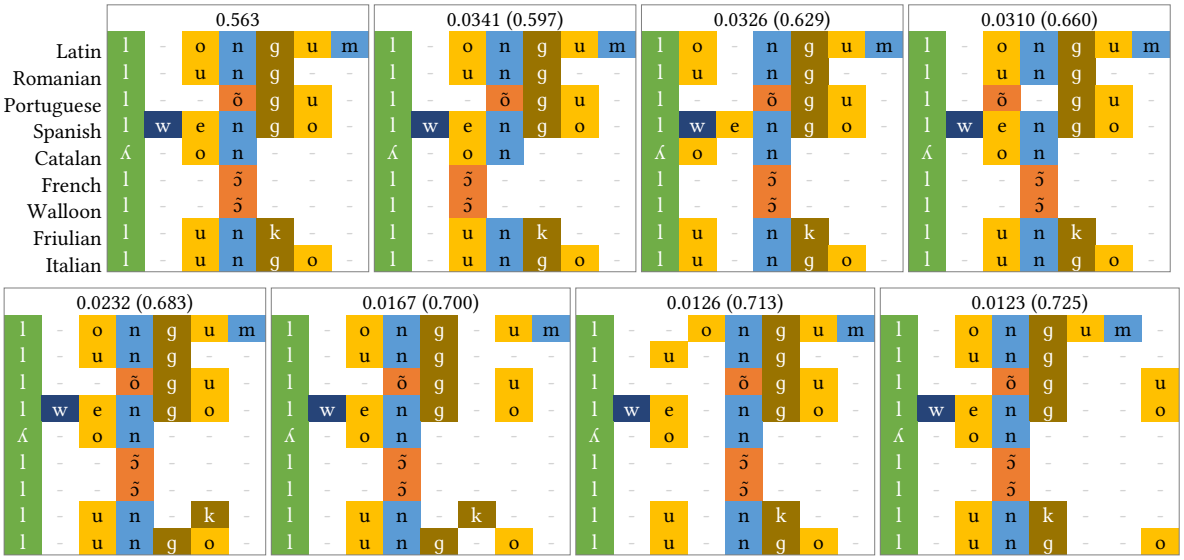
Long

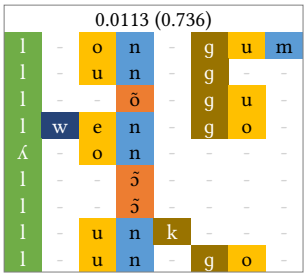

Probability
1.0
0.8
0.4
0.0
1
2
3
4
5
6
7
8
9


0.654
0.0356 (0.689)
0.0205 (0.710)
0.0154 (0.725)
0.0123 (0.737)
0.0120 (0.749)
0.00971 (0.759)
0.00894 (0.768)
0.00883 (0.777)
Latin
Romanian
Portuguese
Spanish
Catalan
French
Walloon
Friulian
Italian

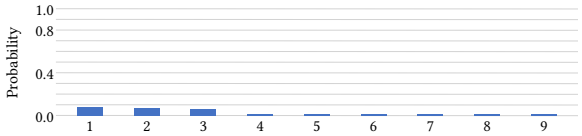
Long

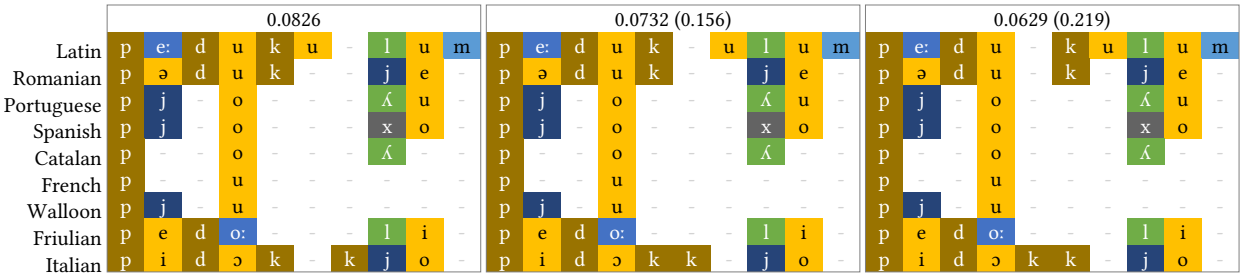

Probability
1.0
0.8
0.4
0.0
1
2
3
4
5
6
7
8
9


0.563
0.0341 (0.597)
0.0326 (0.629)
0.0310 (0.660)
0.0232 (0.683)
0.0167 (0.700)
0.0126 (0.713)
0.0123 (0.725)
Latin
Romanian
Portuguese
Spanish
Catalan
French
Walloon
Friulian
Italian

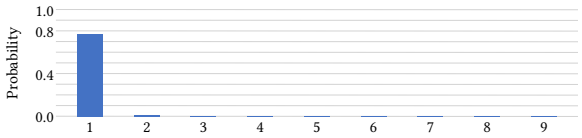

0.0113 (0.736)
l - o n - g u m
l - u n - g - -
l - - õ - g u -
l w e n - g o -
ɣ - o n - - - -
l - - ɔ̃ - - - -
l - - ɔ̃ - - - -
l - u n k - - -
l - u n - g o -

Louse


Probability
1.0
0.8
0.4
0.0
1 2 3 4 5 6 7 8 9


0.0826
0.0732 (0.156)
0.0629 (0.219)
Latin p e: d u k u - l u m p e: d u k - u l u m p e: d u - k u l u m
Romanian p ə d u k - - j e - p ə d u k - - j e - p ə d u - k - j e -
Portuguese p j - o - - - ɣ u - p j - o - - - ɣ u - p j - o - - - ɣ u -
Spanish p j - o - - - x o - p j - o - - - x o - p j - o - - - x o -
Catalan p - - o - - - ɣ - - p - - o - - - ɣ - - p - - o - - - ɣ - -
French p - - u - - - - - - p - - u - - - - - - p - - u - - - - - -
Walloon p j - u - - - - - - p j - u - - - - - - p j - u - - - - - -
Friulian p e d o: - - - l i - p e d o: - - - l i - p e d o: - - - l i -
Italian p i d ɔ k - k j o - p i d ɔ k k - j o - p i d ɔ k k - j o -
0.0182 (0.237)
0.0178 (0.255)
0.0173 (0.272)
p e: d u k - u l u m p e: d u k - u l u m p e: d u - k u l u m
p ə d u k - - j e - p ə d u k - j - e - p ə d u - k j - e -
p - j o - - - ɣ u - p j - o - - ɣ - u - p j - o - - ɣ - u -
p - j o - - - x o - p j - o - - x - o - p j - o - - x - o -
p - - o - - - ɣ - - p - - o - - ɣ - - - p - - o - - ɣ - - -
p - - u - - - - - - p - - u - - - - - - p - - u - - - - - -
p - j u - - - - - - p j - u - - - - - - p j - u - - - - - -
p e d o: - - - l i - p e d o: - - l - i - p e d o: - - l - i -
p i d ɔ k k - j o - p i d ɔ k k j - o - p i d ɔ k k j - o -
0.0168 (0.289)
0.0166 (0.305)
0.0134 (0.319)
p e: d u k u - l u m p e: d u - k u l u m p e: d u k u l u m
p ə d u k - - j e - p ə d u - k - j e - p ə d u k - j e -
p - j o - - - ɣ u - p - j o - - - ɣ u - p j - o - - ɣ u -
p - j o - - - x o - p - j o - - - x o - p j - o - - x o -
p - - o - - - ɣ - - p - - o - - - ɣ - - p - - o - - ɣ - -
p - - u - - - - - - p - - u - - - - - - p - - u - - - - -
p - j u - - - - - - p - j u - - - - - - p j - u - - - - -
p e d o: - - - l i - p e d o: - - - l i - p e d o: - - l i -
p i d ɔ k - k j o - p i d ɔ k k - j o - p i d ɔ k k j o -

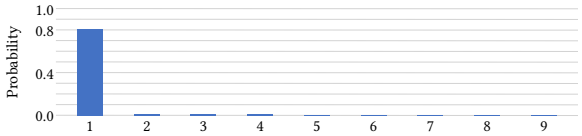
Meat



	0.769	0.0113 (0.780)	0.00829 (0.788)	0.00786 (0.796)
Latin	k a r n e m	- k a r n e m	k - a r n e m	k a - r n e m
Romanian	k a r n e -	- k a r n e -	k - a r n e -	k a - r n e -
Portuguese	k a ɾ n ɨ -	- k a ɾ n ɨ -	k - a ɾ n ɨ -	k a - ɾ n ɨ -
Spanish	k a ɾ n e -	- k a ɾ n e -	k - a ɾ n e -	k a - ɾ n e -
Catalan	k a ɾ n - -	- k a ɾ n - -	k - a ɾ n - -	k a - ɾ n - -
French	ʃ ɛ ʁ - - -	- ʃ ɛ ʁ - - -	ʃ - ɛ ʁ - - -	ʃ ɛ - ʁ - - -
Walloon	ʧ ɑ r - - -	- ʧ ɑ r - - -	ʧ - ɑ r - - -	ʧ ɑ - r - - -
Friulian	c aː r - - -	c - aː r - - -	- c aː r - - -	c - aː r - - -
Italian	k a r n e -	- k a r n e -	k - a r n e -	k a - r n e -

0.00746 (0.804)	0.00746 (0.811)	0.00714 (0.818)	0.00689 (0.825)	0.00580 (0.831)
k a r n e - m	k a r n - e m	k a r n e - m	k a r n e - m	k a r n e m -
k a r n - e -	k a r n - e -	k a r n e - -	k a r n e - -	k a r n - - e
k a ɾ n - ɨ -	k a ɾ n ɨ - -	k a ɾ n - ɨ -	k a ɾ n - ɨ -	k a ɾ n - - ɨ
k a ɾ n - e -	k a ɾ n - e -	k a ɾ n - e -	k a ɾ n e - -	k a ɾ n - - e
k a ɾ n - - -	k a ɾ n - - -	k a ɾ n - - -	k a ɾ n - - -	k a ɾ n - - -
ʃ ɛ ʁ - - - -	ʃ ɛ ʁ - - - -	ʃ ɛ ʁ - - - -	ʃ ɛ ʁ - - - -	ʃ ɛ ʁ - - - -
ʧ ɑ r - - - -	ʧ ɑ r - - - -	ʧ ɑ r - - - -	ʧ ɑ r - - - -	ʧ ɑ r - - - -
c aː r - - - -	c aː r - - - -	c aː r - - - -	c aː r - - - -	c aː r - - - -
k a r n - e -	k a r n - e -	k a r n e - -	k a r n e - -	k a r n - - e

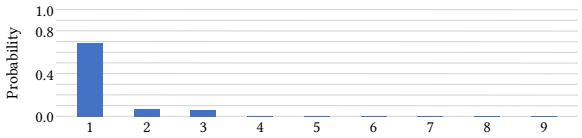
Moon



	0.815	0.0153 (0.830)	0.0115 (0.842)	0.00986 (0.852)	0.00871 (0.861)
Latin	l uː n a m	l uː n a - m	l uː n a m	l uː - n a m	l - uː n a m
Romanian	l u n ə -	l u n - ə -	l u n ə -	l - u n ə -	l u - n ə -
Portuguese	l u - ɐ -	l u - ɐ - -	l u ɐ - -	l - u - ɐ -	l u - - ɐ -
Spanish	l u n a -	l u n a - -	l u n a -	l - u n a -	l u - n a -
Catalan	ʎ u n ə -	ʎ u n ə - -	ʎ u n ə -	ʎ - u n ə -	ʎ u - n ə -
French	l y n - -	l y n - - -	l y n - -	l - y n - -	l y - n - -
Walloon	l ø n - -	l ø n - - -	l ø n - -	l - ø n - -	l ø - n - -
Friulian	l u n e -	l u n e - -	l u n e -	l - u n e -	l u - n e -
Italian	l u n a -	l u n a - -	l u n a -	l - u n a -	l u - n a -

0.00746 (0.868)	0.00531 (0.873)	0.00483 (0.878)	0.00426 (0.882)
l uː n - a m	l uː n - a m	l uː n a m -	l uː n - a m
l u n ə - -	l u n ə - -	l u n - - ə	l u n - ə -
l u - - ɐ -	l u - ɐ - -	l u - - - ɐ	l u - - ɐ -
l u n - a -	l u n a - -	l u n - - a	l u n - a -
ʎ u n - ə -	ʎ u n ə - -	ʎ u n - - ə	ʎ u n - ə -
l y n - - -	l y n - - -	l y n - - -	l y n - - -
l ø n - - -	l ø n - - -	l ø n - - -	l ø n - - -
l u n - e -	l u n e - -	l u n - - e	l u n e - -
l u n - a -	l u n a - -	l u n - - a	l u n - a -

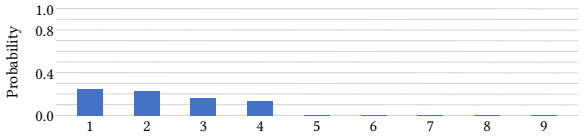
Mountain



	0.686	0.0688 (0.755)	0.0593 (0.814)	0.00837 (0.823)	0.00786 (0.830)
Latin	m o n t e m	m o n t e m	m o n t e m	m o n t e m	m o n t e m
Romanian	m u n t e -	m u n t e -	m u n t e -	m u n t e -	m u n t e -
Portuguese	m - õ t ɨ -	m - õ t ɨ -	m õ - t ɨ -	m - õ t ɨ -	m õ - t ɨ -
Spanish	m o n t e -	m o n t e -	m o n t e -	m o n t e -	m o n t e -
Catalan	m u n - - -	m u n - - -	m u n - - -	m u - - n -	m u n - - -
French	m - ɔ̃ - - -	m ɔ̃ - - - -	m - ɔ̃ - - -	m - - - ɔ̃ -	m ɔ̃ - - - -
Walloon	m - ɔ̃ - - -	m ɔ̃ - - - -	m - ɔ̃ - - -	m - - - ɔ̃ -	m ɔ̃ - - - -
Friulian	m ɔ n t - -	m ɔ n t - -	m ɔ n t - -	m ɔ n t - -	m ɔ n t - -
Italian	m o n t e -	m o n t e -	m o n t e -	m o n t e -	m o n t e -

0.00669 (0.837)	0.00589 (0.843)	0.00574 (0.849)	0.00540 (0.854)
m - o n t e m	m o n t e - m	m o - n t e m	m o n t - e m
m u - n t e -	m u n t e - -	m - u n t e -	m u n t - e -
m - - õ t ɨ -	m - õ t - ɨ -	m - - õ t ɨ -	m - õ t ɨ - -
m - o n t e -	m o n t - e -	m o - n t e -	m o n t - e -
m - u n - - -	m u n - - - -	m u - n - - -	m u n - - - -
m - - ɔ̃ - - -	m - ɔ̃ - - - -	m - - ɔ̃ - - -	m - ɔ̃ - - - -
m - - ɔ̃ - - -	m - ɔ̃ - - - -	m - - ɔ̃ - - -	m - ɔ̃ - - - -
m - ɔ n t - -	m ɔ n t - - -	m ɔ - n t - -	m ɔ n t - - -
m - o n t e -	m o n t e - -	m o - n t e -	m o n t - e -

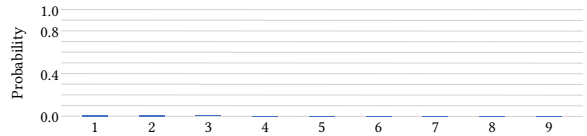
Mouth

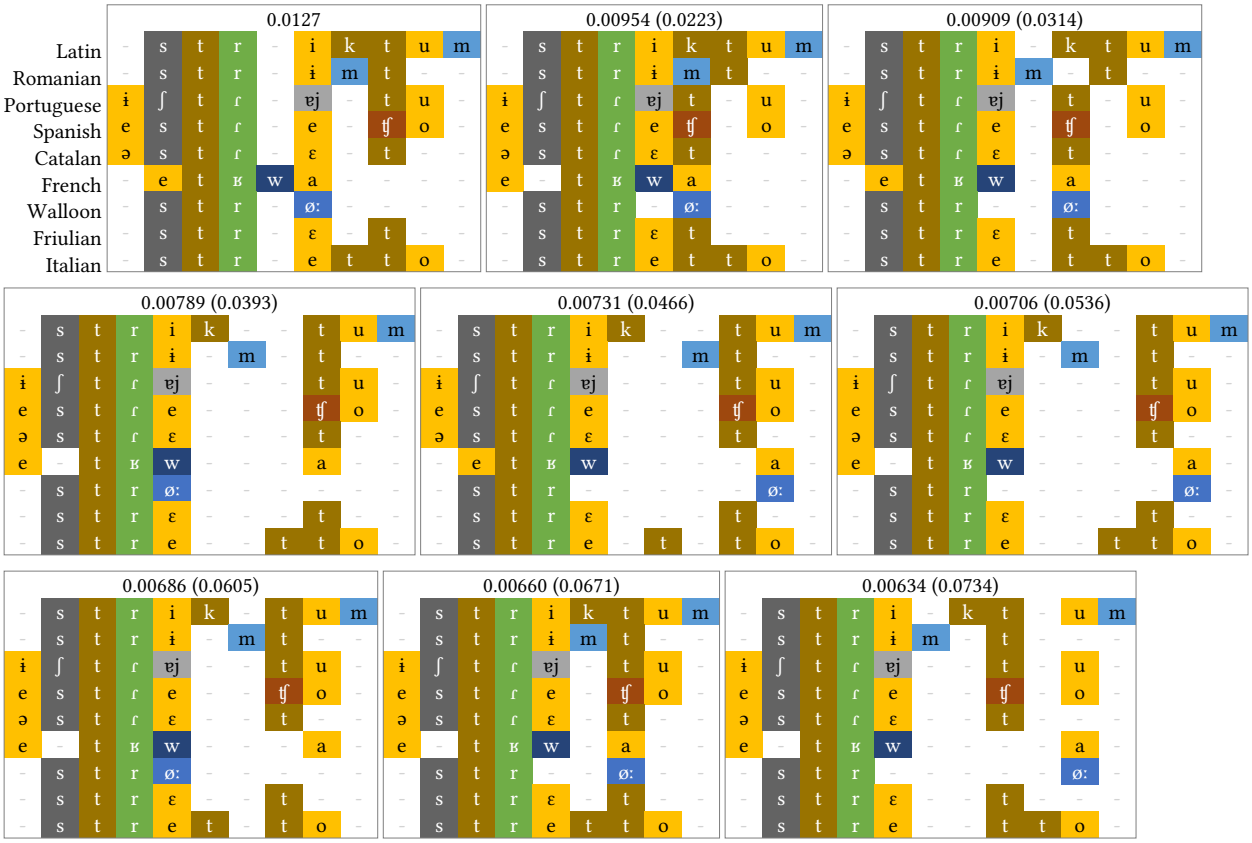


	0.247	0.228 (0.474)	0.164 (0.639)	0.138 (0.777)	0.00557 (0.782)
Latin	b u k k a m	b u k k a m	b u k k a m	b u k k a m	b u k - k a m
Romanian	b u k - ə -	b u - k ə -	b u k - ə -	b u - k ə -	b u k - - ə -
Portuguese	b o - k ɐ -	b o k - ɐ -	b o k - ɐ -	b o - k ɐ -	b o - - k ɐ -
Spanish	b o - k a -	b o k - a -	b o k - a -	b o - k a -	b o - - k a -
Catalan	b o - k ə -	b o k - ə -	b o k - ə -	b o - k ə -	b o - - k ə -
French	b u - ʃ - -	b u ʃ - - -	b u ʃ - - -	b u - ʃ - -	b u - - ʃ - -
Walloon	b ɔ - k - -	b ɔ k - - -	b ɔ k - - -	b ɔ - k - -	b ɔ - - k - -
Friulian	b ɔ - c ɛ -	b ɔ c - ɛ -	b ɔ c - ɛ -	b ɔ - c ɛ -	b ɔ - c - ɛ -
Italian	b o k k a -	b o k k a -	b o k k a -	b o k k a -	b o k - k a -

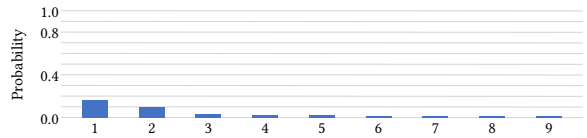
0.00474 (0.787)	0.00469 (0.792)	0.00457 (0.796)	0.00451 (0.801)
b u k k - a m	b u - k k a m	b u k k a m	b u - k k a m
b u k - ə - -	b u - - k ə -	b u k - ə -	b u - k - ə -
b o - k - ɐ -	b o - k - ɐ -	b o k - ɐ -	b o - - k ɐ -
b o - k - a -	b o - k - a -	b o k - a -	b o - - k a -
b o - k - ə -	b o - k - ə -	b o k - ə -	b o - - k ə -
b u - ʃ - - -	b u - ʃ - - -	b u ʃ - - -	b u - - ʃ - -
b ɔ - k - - -	b ɔ - k - - -	b ɔ k - - -	b ɔ - - k - -
b ɔ - c - ɛ -	b ɔ c - - ɛ -	b ɔ - c ɛ -	b ɔ c - - ɛ -
b o k k - a -	b o - k k a -	b o k k a -	b o - k k a -

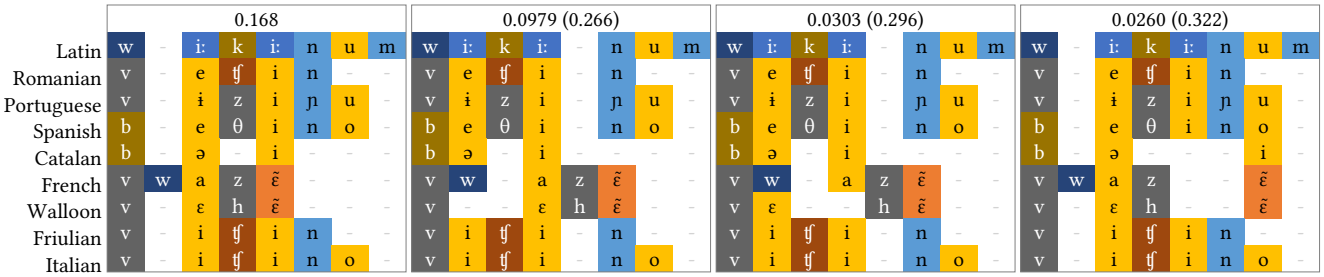
Narrow


Probability
1.0
0.8
0.4
0.0
1
2
3
4
5
6
7
8
9


Latin
Romanian
Portuguese
Spanish
Catalan
French
Walloon
Friulian
Italian
0.0127
0.00954 (0.0223)
0.00909 (0.0314)
0.00789 (0.0393)
0.00731 (0.0466)
0.00706 (0.0536)
0.00686 (0.0605)
0.00660 (0.0671)
0.00634 (0.0734)

Near


Probability
1.0
0.8
0.4
0.0
1
2
3
4
5
6
7
8
9


Latin
Romanian
Portuguese
Spanish
Catalan
French
Walloon
Friulian
Italian
0.168
0.0979 (0.266)
0.0303 (0.296)
0.0260 (0.322)

0.0258 (0.348)

w	-	iː	k	iː	n	u	m
v	-	e	ʧ	i	n	-	-
v	-	ɨ	z	i	ɲ	u	-
b	-	e	θ	i	n	o	-
b	-	ə	-	i	-	-	-
v	w	a	z	-	ɛ̃	-	-
v	-	ɛ	h	-	ɛ̃	-	-
v	-	i	ʧ	i	n	-	-
v	-	i	ʧ	i	n	o	-

0.0157 (0.363)

w	iː	k	iː	n	-	u	m
v	e	ʧ	i	n	-	-	-
v	ɨ	z	i	ɲ	-	u	-
b	e	θ	i	n	-	o	-
b	ə	-	i	-	-	-	-
v	w	-	a	-	z	ɛ̃	-
v	-	-	ɛ	-	h	ɛ̃	-
v	i	ʧ	i	n	-	-	-
v	i	ʧ	i	n	-	o	-

0.0147 (0.378)

w	-	iː	k	iː	n	u	m
v	-	e	ʧ	i	n	-	-
v	-	ɨ	z	i	ɲ	u	-
b	-	e	θ	i	n	o	-
b	-	ə	-	-	i	-	-
v	w	a	z	-	ɛ̃	-	-
v	-	ɛ	h	-	ɛ̃	-	-
v	-	i	ʧ	i	n	-	-
v	-	i	ʧ	i	n	o	-

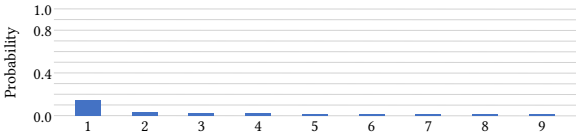
0.0146 (0.393)

w	iː	k	iː	n	u	m	
v	e	ʧ	i	n	-	-	
v	ɨ	z	i	ɲ	u	-	
b	e	θ	i	n	o	-	
b	ə	-	i	-	-	-	
v	w	-	a	z	ɛ̃	-	
v	-	-	ɛ	h	ɛ̃	-	
v	i	ʧ	i	n	-	-	
v	i	ʧ	i	n	o	-	

0.0133 (0.406)

w	iː	k	iː	-	n	u	m
v	e	ʧ	i	-	n	-	-
v	ɨ	z	i	-	ɲ	u	-
b	e	θ	i	-	n	o	-
b	-	ə	i	-	-	-	-
v	-	w	a	z	ɛ̃	-	-
v	-	-	ɛ	h	ɛ̃	-	-
v	i	ʧ	i	-	n	-	-
v	i	ʧ	i	-	n	o	-

New



0.141

Latin	n	-	o	w	u	m
Romanian	n	-	o	w	-	-
Portuguese	n	-	o	v	u	-
Spanish	n	w	e	b	o	-
Catalan	n	-	ɔ	w	-	-
French	n	-	œ	f	-	-
Walloon	n	-	u	-	-	-
Friulian	ɲ	-	uː	f	-	-
Italian	n	w	ɔ	v	o	-

0.0334 (0.174)

Latin	n	-	o	w	u	m
Romanian	n	-	o	w	-	-
Portuguese	n	-	o	v	u	-
Spanish	n	w	e	b	o	-
Catalan	n	-	ɔ	w	-	-
French	n	-	œ	f	-	-
Walloon	n	-	u	-	-	-
Friulian	ɲ	uː	-	f	-	-
Italian	n	w	ɔ	v	o	-

0.0243 (0.199)

Latin	n	-	-	o	w	u	m
Romanian	n	-	-	o	w	-	-
Portuguese	n	-	-	o	v	u	-
Spanish	n	w	-	e	b	o	-
Catalan	n	-	-	ɔ	w	-	-
French	n	-	-	œ	f	-	-
Walloon	n	-	-	u	-	-	-
Friulian	ɲ	-	-	uː	f	-	-
Italian	n	-	w	ɔ	v	o	-

0.0230 (0.222)

Latin	n	-	o	w	u	m
Romanian	n	-	o	-	w	-
Portuguese	n	-	o	v	u	-
Spanish	n	w	e	b	o	-
Catalan	n	-	ɔ	w	-	-
French	n	-	œ	f	-	-
Walloon	n	-	u	-	-	-
Friulian	ɲ	-	uː	f	-	-
Italian	n	w	ɔ	v	o	-

0.0164 (0.238)

Latin	n	o	w	u	m	-
Romanian	n	-	-	o	-	w
Portuguese	n	-	-	o	-	v
Spanish	n	-	w	e	-	b
Catalan	n	-	-	ɔ	-	w
French	n	-	-	œ	-	f
Walloon	n	-	-	u	-	-
Friulian	ɲ	-	-	uː	-	f
Italian	n	-	w	ɔ	-	v

0.0127 (0.251)

Latin	n	o	w	u	m
Romanian	n	-	-	o	w
Portuguese	n	-	-	o	v
Spanish	n	-	w	e	b
Catalan	n	-	-	ɔ	w
French	n	-	-	œ	f
Walloon	n	-	-	u	-
Friulian	ɲ	-	-	uː	f
Italian	n	-	w	ɔ	v

0.0121 (0.263)

Latin	n	o	-	w	u
Romanian	n	o	-	w	-
Portuguese	n	-	o	v	u
Spanish	n	w	e	b	o
Catalan	n	-	ɔ	w	-
French	n	-	œ	f	-
Walloon	n	-	u	-	-
Friulian	ɲ	-	uː	f	-
Italian	n	w	ɔ	v	o

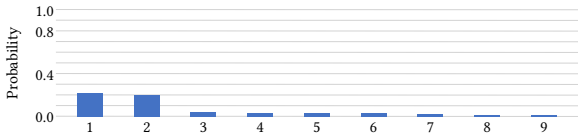
0.0107 (0.274)

Latin	n	-	o	w	u
Romanian	n	-	o	w	-
Portuguese	n	o	-	v	u
Spanish	n	w	e	b	o
Catalan	n	-	ɔ	w	-
French	n	-	œ	f	-
Walloon	n	-	u	-	-
Friulian	ɲ	-	uː	f	-
Italian	n	w	ɔ	v	o

0.0103 (0.284)

Latin	n	-	o	w	u
Romanian	n	-	o	w	-
Portuguese	n	-	o	v	u
Spanish	n	w	e	b	o
Catalan	n	ɔ	-	w	-
French	n	œ	-	f	-
Walloon	n	u	-	-	-
Friulian	ɲ	uː	-	f	-
Italian	n	w	ɔ	v	o

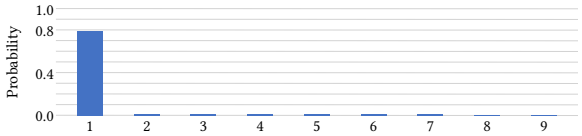
Night



	0.222	0.200 (0.422)	0.0454 (0.468)	0.0344 (0.502)	0.0302 (0.532)
Latin	n o c t e m	n o c t e m	n - o c t e m	n - o c t e m	n o c t e m
Romanian	n o̯a p t e -	n o̯a p t e -	n - o̯a p t e -	n - o̯a p t e -	n o̯a p t e -
Portuguese	n oj - t ɨ -	n oj t - ɨ -	n - oj - t ɨ -	n - oj t - ɨ -	n oj t - ɨ -
Spanish	n o - ʧ e -	n o ʧ - e -	n - o - ʧ e -	n - o ʧ - e -	n o ʧ - e -
Catalan	n i - t - -	n i t - - -	n - i - t - -	n - i t - - -	n i t - - -
French	n ɥ - i - -	n ɥ i - - -	n ɥ i - - -	n ɥ i - - -	n ɥ - - i -
Walloon	n y - t - -	n y t - - -	n - y - t - -	n - y t - - -	n y t - - -
Friulian	ɲ ɔ - t - -	ɲ ɔ t - - -	ɲ - ɔ - t - -	ɲ - ɔ t - - -	ɲ ɔ t - - -
Italian	n ɔ t t e -	n ɔ t t e -	n - ɔ t t e -	n - ɔ t t e -	n ɔ t t e -

	0.0291 (0.562)	0.0236 (0.585)	0.0134 (0.599)	0.0126 (0.611)
Latin	n o c t e m	n o c - t e m	n o c - t e m	n o - c t e m
Romanian	n o̯a p t e -	n o̯a p - t e -	n o̯a p - t e -	n o̯a - p t e -
Portuguese	n oj - t ɨ -	n oj - - t ɨ -	n oj t - - ɨ -	n oj - t - ɨ -
Spanish	n o - ʧ e -	n o - - ʧ e -	n o ʧ - - e -	n o - ʧ - e -
Catalan	n i - t - -	n i - - t - -	n i t - - - -	n i - t - - -
French	n ɥ - - i -	n ɥ - i - - -	n ɥ - i - - -	n ɥ i - - - -
Walloon	n y - t - -	n y - - t - -	n y t - - - -	n y - t - - -
Friulian	ɲ ɔ - t - -	ɲ ɔ - - t - -	ɲ ɔ t - - - -	ɲ ɔ - t - - -
Italian	n ɔ t t e -	n ɔ t - t e -	n ɔ t - t e -	n ɔ - t t e -

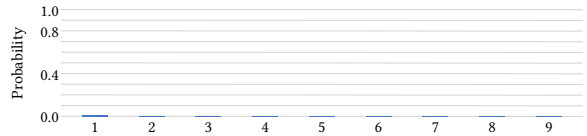
Not

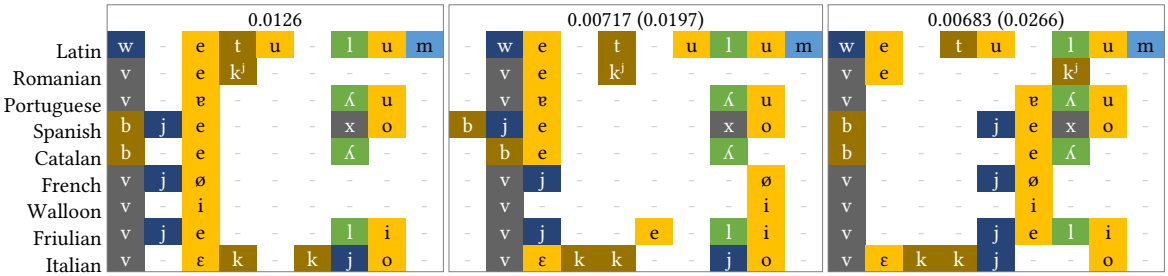


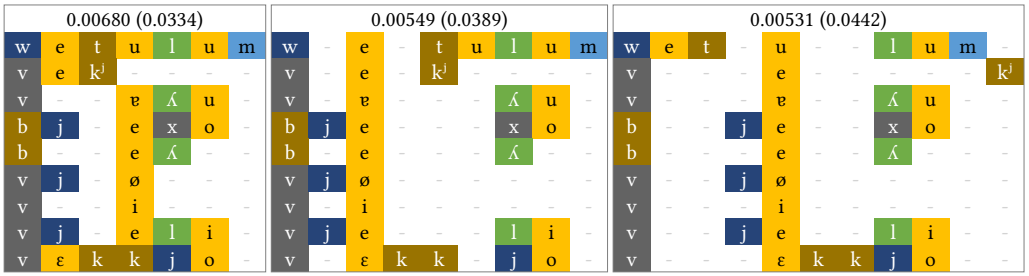
	0.795	0.0181 (0.813)	0.0177 (0.831)	0.0176 (0.848)	0.0169 (0.865)	0.0125 (0.878)	0.0105 (0.888)	0.00920 (0.897)
Latin	n oː n	n oː n -	n oː n	n oː n -	n oː - n	n oː - n	n oː - n	n - oː n
Romanian	n u -	- - n u	n - u	n - - u	n - u -	n - u -	n u - -	n u - -
Portuguese	n ɐ̃w -	n ɐ̃w - -	n ɐ̃w -	n ɐ̃w - -	n - ɐ̃w -	n ɐ̃w - -	n ɐ̃w - -	n ɐ̃w - -
Spanish	n o -	n o - -	n o -	n o - -	n - o -	n o - -	n o - -	n o - -
Catalan	n o -	n o - -	n o -	n o - -	n - o -	n o - -	n o - -	n o - -
French	n ɔ̃ -	n ɔ̃ - -	n ɔ̃ -	n ɔ̃ - -	n - ɔ̃ -	n ɔ̃ - -	n ɔ̃ - -	n ɔ̃ - -
Walloon	n ɔ̃ -	n ɔ̃ - -	n ɔ̃ -	n ɔ̃ - -	n - ɔ̃ -	n ɔ̃ - -	n ɔ̃ - -	n ɔ̃ - -
Friulian	n ɔ -	n ɔ - -	n ɔ -	n ɔ - -	n - ɔ -	n ɔ - -	n ɔ - -	n ɔ - -
Italian	n o n	n o n -	n o n	n o n -	n - o n	n o - n	n o n -	n o - n

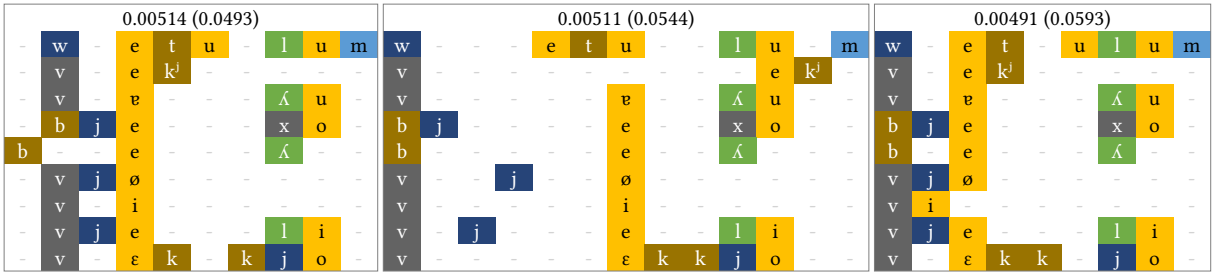
	0.00800 (0.905)
Latin	n oː n -
Romanian	n u - -
Portuguese	n ɐ̃w - -
Spanish	n o - -
Catalan	n o - -
French	n ɔ̃ - -
Walloon	n ɔ̃ - -
Friulian	n ɔ - -
Italian	n o - n

Old

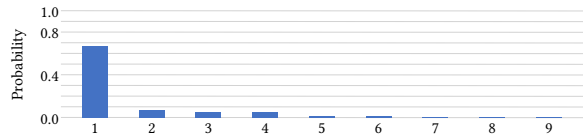

Probability
1.0
0.8
0.4
0.0
1 2 3 4 5 6 7 8 9

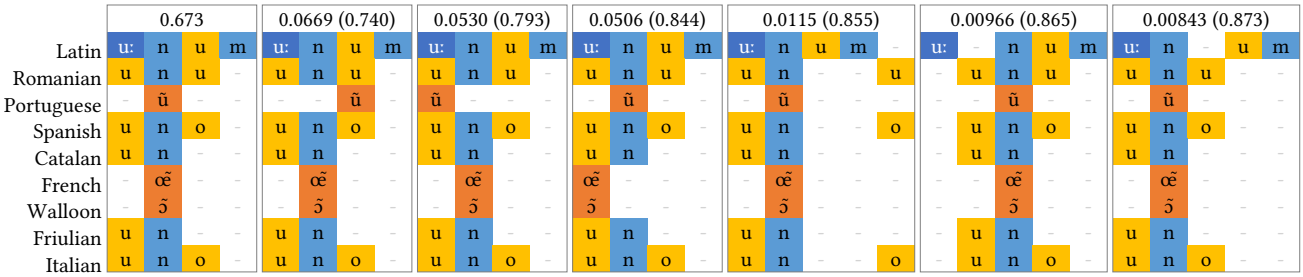

0.0126
0.00717 (0.0197)
0.00683 (0.0266)
Latin
Romanian
Portuguese
Spanish
Catalan
French
Walloon
Friulian
Italian


0.00680 (0.0334)
0.00549 (0.0389)
0.00531 (0.0442)


0.00514 (0.0493)
0.00511 (0.0544)
0.00491 (0.0593)

One

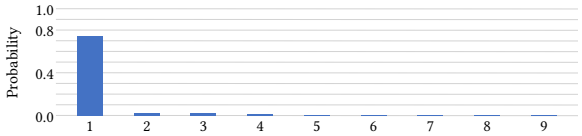

Probability
1.0
0.8
0.4
0.0
1 2 3 4 5 6 7 8 9


0.673
0.0669 (0.740)
0.0530 (0.793)
0.0506 (0.844)
0.0115 (0.855)
0.00966 (0.865)
0.00843 (0.873)
Latin
Romanian
Portuguese
Spanish
Catalan
French
Walloon
Friulian
Italian

0.00646 (0.880)				
uː	n	u	-	m
u	n	-	u	-
-	ũ	-	-	-
u	n	-	o	-
u	n	-	-	-
-	œ̃	-	-	-
-	ɔ̃	-	-	-
u	n	-	-	-
u	n	-	o	-

0.00497 (0.885)			
uː	n	u	m
u	n	u	-
ũ	-	-	-
u	n	o	-
u	n	-	-
œ̃	-	-	-
ɔ̃	-	-	-
u	n	-	-
u	n	o	-

Other



	0.745						
Latin	a	l	t	e	r	u	m
Romanian	a	l	t	-	-	-	-
Portuguese	o	-	t	-	ɾ	u	-
Spanish	o	-	t	-	ɾ	o	-
Catalan	a	l	t	-	ɾ	ə	-
French	o	-	t	-	ʁ	-	-
Walloon	o	-	t	-	-	-	-
Friulian	a	l	t	-	r	i	-
Italian	a	l	t	-	r	o	-

0.0226 (0.768)							
a	l	t	e	r	u	-	m
a	l	t	-	-	-	-	-
o	-	t	-	ɾ	-	u	-
o	-	t	-	ɾ	-	o	-
a	l	t	-	ɾ	-	ə	-
o	-	t	-	ʁ	-	-	-
o	-	t	-	-	-	-	-
a	l	t	-	r	-	i	-
a	l	t	-	r	-	o	-

0.0193 (0.787)							
a	l	t	e	r	u	m	-
a	l	t	-	-	-	-	-
o	-	t	-	ɾ	-	-	u
o	-	t	-	ɾ	-	-	o
a	l	t	-	ɾ	-	-	ə
o	-	t	-	ʁ	-	-	-
o	-	t	-	-	-	-	-
a	l	t	-	r	-	-	i
a	l	t	-	r	-	-	o

0.0160 (0.803)							
a	l	t	e	r	-	u	m
a	l	t	-	-	-	-	-
o	-	t	-	ɾ	u	-	-
o	-	t	-	ɾ	o	-	-
a	l	t	-	ɾ	ə	-	-
o	-	t	-	ʁ	-	-	-
o	-	t	-	-	-	-	-
a	l	t	-	r	i	-	-
a	l	t	-	r	o	-	-

0.00874 (0.812)							
a	l	t	e	r	u	m	-
a	l	t	-	-	-	-	-
o	-	t	-	ɾ	u	-	-
o	-	t	-	ɾ	o	-	-
a	l	t	-	ɾ	ə	-	-
o	-	t	-	-	-	-	ʁ
o	-	t	-	-	-	-	-
a	l	t	-	r	i	-	-
a	l	t	-	r	o	-	-

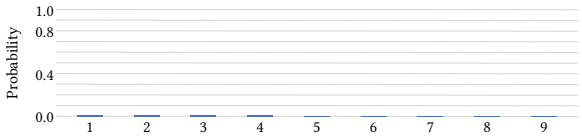
0.00860 (0.820)							
a	l	t	e	r	u	m	
a	l	t	-	-	-	-	-
o	-	t	-	ɾ	u	-	-
o	-	t	-	ɾ	o	-	-
a	l	t	-	ɾ	ə	-	-
o	-	t	-	-	ʁ	-	-
o	-	t	-	-	-	-	-
a	l	t	-	r	i	-	-
a	l	t	-	r	o	-	-

0.00846 (0.829)							
a	l	t	e	r	u	m	
a	l	t	-	-	-	-	-
o	-	t	-	ɾ	u	-	-
o	-	t	-	ɾ	o	-	-
a	l	t	-	ɾ	ə	-	-
-	o	t	-	ʁ	-	-	-
-	o	t	-	-	-	-	-
a	l	t	-	r	i	-	-
a	l	t	-	r	o	-	-

0.00551 (0.834)							
a	l	t	e	r	-	u	m
a	l	t	-	-	-	-	-
o	-	t	-	-	ɾ	u	-
o	-	t	-	-	ɾ	o	-
a	l	t	-	-	ɾ	ə	-
o	-	t	-	-	ʁ	-	-
o	-	t	-	-	-	-	-
a	l	t	-	-	r	i	-
a	l	t	-	-	r	o	-

0.00523 (0.839)							
a	l	t	e	r	u	-	m
a	l	t	-	-	-	-	-
o	-	t	-	ɾ	u	-	-
o	-	t	-	ɾ	o	-	-
a	l	t	-	ɾ	-	ə	-
o	-	t	-	ʁ	-	-	-
o	-	t	-	-	-	-	-
a	l	t	-	r	i	-	-
a	l	t	-	r	o	-	-

Rain

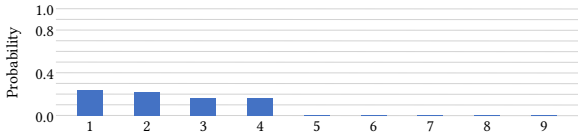


	0.0127	0.0115 (0.0242)	0.0103 (0.0345)	0.0102 (0.0447)
Latin	p l u w i a m	p l u - w i a m	p l u - - w i a m	p l u w i a m
Romanian	p l ɑ̯a - j e -	p l ɑ̯a - - j e -	p l ɑ̯a - - - j e -	p l ɑ̯a - j e -
Portuguese	ʃ - u - v ɐ -	ʃ - u - - v ɐ -	ʃ - u - - - v ɐ -	ʃ - u v - ɐ -
Spanish	ʝ - u b j a -	ʝ - u b - j a -	ʝ - u b - - j a -	ʝ - u b j a -
Catalan	p l u - ʒ ə -	p l u - - ʒ ə -	p l u - - - ʒ ə -	p l u - ʒ ə -
French	p l ɥ - i - -	p l ɥ - - i - -	p l ɥ - - - i - -	p l ɥ - i - -
Walloon	p l ɛ - f - -	p l ɛ - - f - -	p l ɛ - - - f - -	p l ɛ - f - -
Friulian	p l o - j e -	p l o - - j e -	p l o - - - j e -	p l o - j e -
Italian	p j ɔ d ʤ a -	p j ɔ - d ʤ a -	p j ɔ - d - ʤ a -	p j ɔ d ʤ a -

	0.00889 (0.0535)	0.00874 (0.0623)	0.00871 (0.0710)	0.00871 (0.0797)
Latin	p l u - w - i a m	p l u - - w i a m	p l u - - w i a m	p l u w i a m
Romanian	p l ɑ̯a - - - j e -	p l ɑ̯a - - j - e -	p l ɑ̯a - - j - e -	p l ɑ̯a - j e -
Portuguese	ʃ - u - - - v ɐ -	ʃ - u - - v - ɐ -	ʃ - u - - v - ɐ -	ʃ - u - v ɐ -
Spanish	ʝ - u - - b j a -	ʝ - u b - j - a -	ʝ - u - b j - a -	ʝ - u b j a -
Catalan	p l u - - - ʒ ə -	p l u - - ʒ - ə -	p l u - - ʒ - ə -	p l u ʒ - ə -
French	p l ɥ - - - - i -	p l ɥ - - i - - -	p l ɥ - - - - i -	p l ɥ i - - -
Walloon	p l ɛ - - - - f -	p l ɛ - - f - - -	p l ɛ - - - - f -	p l ɛ f - - -
Friulian	p l o - - - j e -	p l o - - j - e -	p l o - - j - e -	p l o - j e -
Italian	p j ɔ d - - ʤ a -	p j ɔ - d ʤ - a -	p j ɔ d - ʤ - a -	p j ɔ d ʤ a -

	0.00826 (0.0880)
Latin	p l u w - - i a m
Romanian	p l ɑ̯a - - - j e -
Portuguese	ʃ - u - - - v ɐ -
Spanish	ʝ - u - b - j a -
Catalan	p l u - - - ʒ ə -
French	p l - - - - ɥ i -
Walloon	p l - - - - ɛ f -
Friulian	p l o - - - j e -
Italian	p j ɔ - - d ʤ a -

Red



	0.242	0.218 (0.460)	0.165 (0.625)	0.164 (0.790)	0.00509 (0.795)
Latin	r u s s u m	r u s s u m	r u s s u m	r u s s u m	r - u s s u m
Romanian	r o - ʃ u -	r o ʃ - u -	r o - ʃ u -	r o ʃ - u -	r o - - ʃ u -
Portuguese	ʁ o - ʃ u -	ʁ o ʃ - u -	ʁ o ʃ - u -	ʁ o - ʃ u -	ʁ o - - ʃ u -
Spanish	r o - x o -	r o x - o -	r o x - o -	r o - x o -	r o - - x o -
Catalan	r o - s - -	r o s - - -	r o s - - -	r o - s - -	r o - - s - -
French	ʁ u - - - -	ʁ u - - - -	ʁ u - - - -	ʁ u - - - -	ʁ u - - - -
Walloon	r ɔ - ʤ - -	r ɔ ʤ - - -	r ɔ ʤ - - -	r ɔ - ʤ - -	r ɔ - - ʤ - -
Friulian	r ɔ - s - -	r ɔ s - - -	r ɔ s - - -	r ɔ - s - -	r ɔ - - s - -
Italian	r o s s o -	r o s s o -	r o s s o -	r o s s o -	r o - s s o -

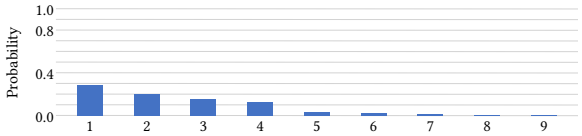
0.00437 (0.799)					
r	u	s	s	u	m
r	o	ʃ	u	–	–
ʁ	o	ʃ	–	u	–
r	o	x	–	o	–
r	o	s	–	–	–
ʁ	u	–	–	–	–
r	ɔ	ʤ	–	–	–
r	ɔ	s	–	–	–
r	o	s	s	o	–

0.00426 (0.803)						
r	u	s	–	s	u	m
r	o	–	ʃ	–	u	–
ʁ	o	ʃ	–	–	u	–
r	o	x	–	–	o	–
r	o	s	–	–	–	–
ʁ	u	–	–	–	–	–
r	ɔ	ʤ	–	–	–	–
r	ɔ	s	–	–	–	–
r	o	s	–	s	o	–

0.00423 (0.808)					
r	u	s	s	u	m
r	o	–	ʃ	u	–
ʁ	o	ʃ	–	u	–
r	o	x	–	o	–
r	o	s	–	–	–
ʁ	–	u	–	–	–
r	ɔ	ʤ	–	–	–
r	ɔ	s	–	–	–
r	o	s	s	o	–

0.00403 (0.812)						
r	u	s	s	u	m	–
r	o	ʃ	–	–	–	u
ʁ	o	ʃ	–	–	–	u
r	o	x	–	–	–	o
r	o	s	–	–	–	–
ʁ	u	–	–	–	–	–
r	ɔ	ʤ	–	–	–	–
r	ɔ	s	–	–	–	–
r	o	s	s	–	–	o

River



	0.285				
Latin	r	iː	w	u	m
Romanian	r	ɨ	w	–	–
Portuguese	ʁ	i	u	–	–
Spanish	r	i	o	–	–
Catalan	r	i	w	–	–
French	ʁ	y	–	–	–
Walloon	r	ɛ	–	–	–
Friulian	r	i	u	–	–
Italian	r	i	o	–	–

0.197 (0.482)					
r	iː	w	u	m	
r	ɨ	–	w	–	
ʁ	i	–	u	–	
r	i	–	o	–	
r	i	–	w	–	
ʁ	y	–	–	–	
r	ɛ	–	–	–	
r	i	–	u	–	
r	i	–	o	–	

0.150 (0.633)					
r	iː	w	u	m	
r	ɨ	w	–	–	
ʁ	i	u	–	–	
r	i	o	–	–	
r	i	w	–	–	
ʁ	–	y	–	–	
r	–	ɛ	–	–	
r	i	u	–	–	
r	i	o	–	–	

0.124 (0.757)					
r	iː	w	u	m	
r	ɨ	–	w	–	
ʁ	i	–	u	–	
r	i	–	o	–	
r	i	–	w	–	
ʁ	–	–	y	–	
r	–	–	ɛ	–	
r	i	–	u	–	
r	i	–	o	–	

0.0344 (0.791)					
r	iː	w	u	m	
r	–	ɨ	w	–	
ʁ	–	i	u	–	
r	–	i	o	–	
r	–	i	w	–	
ʁ	–	y	–	–	
r	–	ɛ	–	–	
r	–	i	u	–	
r	–	i	o	–	

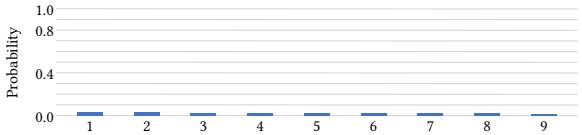
0.0210 (0.812)					
r	iː	w	u	m	
r	–	ɨ	w	–	
ʁ	–	i	u	–	
r	–	i	o	–	
r	–	i	w	–	
ʁ	–	–	y	–	
r	–	–	ɛ	–	
r	–	i	u	–	
r	–	i	o	–	

0.0106 (0.823)				
r	iː	w	u	m
r	ɨ	w	–	–
ʁ	i	–	u	–
r	i	–	o	–
r	i	–	w	–
ʁ	y	–	–	–
r	ɛ	–	–	–
r	i	–	u	–
r	i	–	o	–

0.00491 (0.828)					
r	iː	w	–	u	m
r	ɨ	–	w	–	–
ʁ	i	–	u	–	–
r	i	–	o	–	–
r	i	–	w	–	–
ʁ	y	–	–	–	–
r	ɛ	–	–	–	–
r	i	–	u	–	–
r	i	–	o	–	–

0.00434 (0.832)					
r	iː	–	w	u	m
r	ɨ	–	w	–	–
ʁ	i	u	–	–	–
r	i	o	–	–	–
r	i	w	–	–	–
ʁ	y	–	–	–	–
r	ɛ	–	–	–	–
r	i	u	–	–	–
r	i	o	–	–	–

Round



	0.0299							
Latin	r	o	t	u	n	d	u	m
Romanian	r	ə	t	u	n	d	–	–
Portuguese	ʁ	ɨ	d	–	õ	d	u	–
Spanish	r	e	d	o	n	d	o	–
Catalan	r	ə	d	o	–	–	–	–
French	ʁ	–	–	ɔ̃	–	–	–	–
Walloon	r	–	–	ɔ̃	–	–	–	–
Friulian	t	a	r	ɔ	n	t	–	–
Italian	r	o	t	o	n	d	o	–

0.0295 (0.0594)							
r	o	t	u	n	d	u	m
r	ə	t	u	n	d	–	–
ʁ	ɨ	d	–	õ	d	u	–
r	e	d	o	n	d	o	–
r	ə	d	–	–	–	o	–
ʁ	–	–	–	–	–	ɔ̃	–
r	–	–	–	–	–	ɔ̃	–
t	a	r	ɔ	n	t	–	–
r	o	t	o	n	d	o	–

0.0245 (0.0839)							
r	o	t	u	n	d	u	m
r	ə	t	u	n	d	–	–
ʁ	ɨ	d	–	õ	d	u	–
r	e	d	o	n	d	o	–
r	–	–	ə	–	d	o	–
ʁ	–	–	–	–	–	ɔ̃	–
r	–	–	–	–	–	ɔ̃	–
t	a	r	ɔ	n	t	–	–
r	o	t	o	n	d	o	–

0.0243 (0.108)									
-	-	r	o	t	u	n	d	u	m
-	-	r	ə	t	u	n	d	-	-
-	-	ʁ	ɨ	d	-	õ	d	u	-
-	-	r	e	d	o	n	d	o	-
-	-	r	ə	d	-	-	-	o	-
-	-	ʁ	-	-	-	-	-	ɔ̃	-
-	-	r	-	-	-	-	-	ɔ̃	-
t	a	r	-	-	ɔ	n	t	-	-
-	-	r	o	t	o	n	d	o	-

0.0237 (0.132)									
r	o	t	u	n	d	u	m		
r	ə	t	u	n	d	-	-		
ʁ	ɨ	d	-	õ	d	u	-		
r	e	d	o	n	d	o	-		
r	ə	d	o	-	-	-	-		
ʁ	ɔ̃	-	-	-	-	-	-		
r	ɔ̃	-	-	-	-	-	-		
t	a	r	ɔ	n	t	-	-		
r	o	t	o	n	d	o	-		

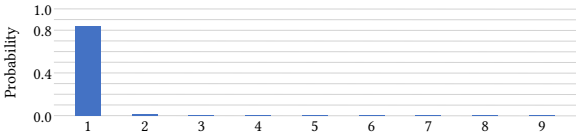
0.0221 (0.154)									
-	-	r	o	t	u	n	d	u	m
-	-	r	ə	t	u	n	d	-	-
-	-	ʁ	ɨ	d	-	õ	d	u	-
-	-	r	e	d	o	n	d	o	-
-	-	r	ə	d	o	-	-	-	-
-	-	ʁ	ɔ̃	-	-	-	-	-	-
-	-	r	ɔ̃	-	-	-	-	-	-
t	a	r	-	-	ɔ	n	t	-	-
-	-	r	o	t	o	n	d	o	-

0.0207 (0.175)									
-	-	r	o	t	u	n	d	u	m
-	-	r	ə	t	u	n	d	-	-
-	-	ʁ	ɨ	d	-	õ	d	u	-
-	-	r	e	d	o	n	d	o	-
-	-	r	ə	d	-	-	-	o	-
-	-	ʁ	ɔ̃	-	-	-	-	-	-
-	-	r	ɔ̃	-	-	-	-	-	-
t	a	r	-	-	ɔ	n	t	-	-
-	-	r	o	t	o	n	d	o	-

0.0199 (0.195)									
r	o	t	u	n	d	u	m		
r	ə	t	u	n	d	-	-		
ʁ	ɨ	d	-	õ	d	u	-		
r	e	d	o	n	d	o	-		
r	ə	-	-	-	d	o	-		
ʁ	-	-	-	-	-	ɔ̃	-		
r	-	-	-	-	-	ɔ̃	-		
t	a	r	ɔ	n	t	-	-		
r	o	t	o	n	d	o	-		

0.0147 (0.209)									
-	-	r	o	t	u	n	d	u	m
-	-	r	ə	t	u	n	d	-	-
-	-	ʁ	ɨ	d	-	õ	d	u	-
-	-	r	e	d	o	n	d	o	-
-	-	r	ə	-	-	-	d	o	-
-	-	ʁ	-	-	-	-	-	ɔ̃	-
-	-	r	-	-	-	-	-	ɔ̃	-
t	a	r	-	-	ɔ	n	t	-	-
-	-	r	o	t	o	n	d	o	-

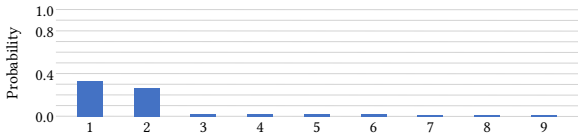
Sea



	0.843				0.0101 (0.853)					0.00926 (0.862)					0.00783 (0.870)					0.00757 (0.878)					0.00646 (0.884)				
Latin	m	a	r	e	m	a	r	e	-	m	a	r	-	e	m	a	r	-	e	m	a	r	e	-	m	a	r	e	-
Romanian	m	a	r	e	m	a	r	-	e	m	a	r	e	-	m	a	r	e	-	m	a	r	-	e	m	a	r	e	-
Portuguese	m	a	ɾ	-	m	a	ɾ	-	-	m	a	ɾ	-	-	m	a	ɾ	-	-	m	a	ɾ	-	-	m	a	-	-	ɾ
Spanish	m	a	ɾ	-	m	a	ɾ	-	-	m	a	ɾ	-	-	m	a	ɾ	-	-	m	a	ɾ	-	-	m	a	-	-	ɾ
Catalan	m	a	ɾ	-	m	a	ɾ	-	-	m	a	ɾ	-	-	m	a	ɾ	-	-	m	a	ɾ	-	-	m	a	-	-	ɾ
French	m	ɛ	ʁ	-	m	ɛ	ʁ	-	-	m	ɛ	ʁ	-	-	m	ɛ	ʁ	-	-	m	ɛ	ʁ	-	-	m	ɛ	-	-	ʁ
Walloon	m	e	r	-	m	e	r	-	-	m	e	r	-	-	m	e	r	-	-	m	e	r	-	-	m	e	-	-	r
Friulian	m	aː	r	-	m	aː	r	-	-	m	aː	r	-	-	m	aː	r	-	-	m	aː	r	-	-	m	aː	-	-	r
Italian	m	a	r	e	m	a	r	-	e	m	a	r	e	-	m	a	r	-	e	m	a	r	e	-	m	a	r	e	-

0.00503 (0.889)					0.00483 (0.894)					0.00449 (0.899)				
m	a	r	-	e	m	a	r	-	e	m	a	-	r	e
m	a	-	r	e	m	a	r	-	e	m	a	-	r	e
m	a	-	ɾ	-	m	a	-	ɾ	-	m	a	-	ɾ	-
m	a	-	ɾ	-	m	a	-	ɾ	-	m	a	-	ɾ	-
m	a	-	ɾ	-	m	a	-	ɾ	-	m	a	-	ɾ	-
m	ɛ	-	ʁ	-	m	ɛ	-	ʁ	-	m	ɛ	-	ʁ	-
m	e	-	r	-	m	e	-	r	-	m	e	-	r	-
m	aː	-	r	-	m	aː	r	-	-	m	-	aː	r	-
m	a	-	r	e	m	a	r	-	e	m	a	-	r	e

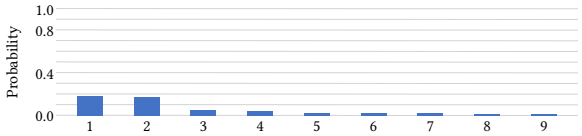
Seed



	0.336	0.270 (0.606)	0.0265 (0.632)	0.0232 (0.655)	0.0222 (0.677)
Latin	g r aː n u m	g r aː n u m	g r aː n u m	g r aː n u m	g r aː n u m
Romanian	g r - - ɨw -	g r ɨw - - -	g r - - ɨw -	g r - - ɨw -	g r - - ɨw -
Portuguese	g ɾ - ɐ̃w - -	g ɾ - ɐ̃w - -	g ɾ - - ɐ̃w -	g ɾ - ɐ̃w - -	g ɾ ɐ̃w - - -
Spanish	g ɾ a n o -	g ɾ a n o -	g ɾ a n o -	g ɾ a n o -	g ɾ a n o -
Catalan	g ɾ a - - -	g ɾ a - - -	g ɾ a - - -	g ɾ a - - -	g ɾ a - - -
French	g ʁ - ɛ̃ - -	g ʁ - ɛ̃ - -	g ʁ - ɛ̃ - -	g ʁ ɛ̃ - - -	g ʁ - ɛ̃ - -
Walloon	g r i n - -	g r i n - -	g r i n - -	g r i n - -	g r i n - -
Friulian	g r a n - -	g r a n - -	g r a n - -	g r a n - -	g r a n - -
Italian	g r a n o -	g r a n o -	g r a n o -	g r a n o -	g r a n o -

0.0211 (0.699)	0.0179 (0.716)	0.0163 (0.733)	0.0147 (0.747)
g r aː n u m	g r aː n u m	g r aː n u m	g r aː n u m
g r ɨw - - -	g r ɨw - - -	g r ɨw - - -	g r - ɨw - -
g ɾ - - ɐ̃w -	g ɾ ɐ̃w - - -	g ɾ - ɐ̃w - -	g ɾ - ɐ̃w - -
g ɾ a n o -	g ɾ a n o -	g ɾ a n o -	g ɾ a n o -
g ɾ a - - -	g ɾ a - - -	g ɾ a - - -	g ɾ a - - -
g ʁ - ɛ̃ - -	g ʁ - ɛ̃ - -	g ʁ ɛ̃ - - -	g ʁ - ɛ̃ - -
g r i n - -	g r i n - -	g r i n - -	g r i n - -
g r a n - -	g r a n - -	g r a n - -	g r a n - -
g r a n o -	g r a n o -	g r a n o -	g r a n o -

Seed



	0.182	0.177 (0.359)	0.0519 (0.411)
Latin	s eː m - e n t i a	s eː m - e n t i a	s eː m - e n t i a
Romanian	s ə m - ɨ n ts ə -	s ə m - ɨ n ts - ə	s ə m - ɨ n ts - ə
Portuguese	s ɨ m - - ɐ̃ t ɨ -	s ɨ m - - ɐ̃ t - ɨ	s ɨ m - - ɐ̃ t - ɨ
Spanish	s i m j e n t e -	s i m j e n t - e	s i m j e n t - e
Catalan	s ə m - e n - - -	s ə m - e n - - -	s ə m - e n - - -
French	s ə m - - ɑ̃ s - -	s ə m - - ɑ̃ s - -	s ə m - ɑ̃ s - - -
Walloon	s i m - - ɐ̃ s - -	s i m - - ɐ̃ s - -	s i m - ɐ̃ s - - -
Friulian	s e m - ɛ n ʧ ɛ -	s e m - ɛ n ʧ - ɛ	s e m - ɛ n ʧ - ɛ
Italian	s e m - e n t e -	s e m - e n t - e	s e m - e n t - e

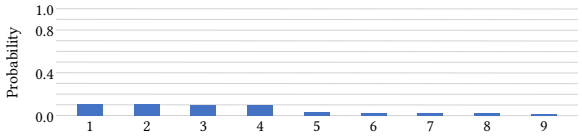
0.0402 (0.451)	0.0228 (0.474)	0.0212 (0.495)
s eː m - e n t i a	s eː m - e n t i a	s eː m - e n t i a -
s ə m - ɨ n ts ə -	s ə m - ɨ n ts ə -	s ə m - ɨ n ts - ə -
s ɨ m - - ɐ̃ t ɨ -	s ɨ m - - ɐ̃ t ɨ -	s ɨ m - - ɐ̃ t - ɨ -
s i m j e n t e -	s i m j e n t e -	s i m j e n t - e -
s ə m - e n - - -	s ə m - e n - - -	s ə m - e n - - - -
s ə m - ɑ̃ s - - -	s ə m - - ɑ̃ - s -	s ə m - - ɑ̃ - - - s
s i m - ɐ̃ s - - -	s i m - - ɐ̃ - s -	s i m - - ɐ̃ - - - s
s e m - ɛ n ʧ ɛ -	s e m - ɛ n ʧ ɛ -	s e m - ɛ n ʧ - ɛ -
s e m - e n t e -	s e m - e n t e -	s e m - e n t - e -

0.0196 (0.515)								
s	eː	m	-	e	n	t	i	a
s	ə	m	-	ɨ	n	ʦ	ə	-
s	ɨ	m	-	-	ẽ	t	ɨ	-
s	i	m	j	e	n	t	e	-
s	ə	m	-	e	n	-	-	-
s	ə	m	-	ɑ̃	-	s	-	-
s	i	m	-	ẽ	-	s	-	-
s	e	m	-	ɛ	n	ʧ	ɛ	-
s	e	m	-	e	n	t	e	-

0.0170 (0.532)								
s	eː	m	-	e	n	t	i	a
s	ə	m	-	ɨ	n	ʦ	-	ə
s	ɨ	m	-	-	ẽ	t	-	ɨ
s	i	m	j	e	n	t	-	e
s	ə	m	-	e	n	-	-	-
s	ə	m	-	ɑ̃	-	s	-	-
s	i	m	-	ẽ	-	s	-	-
s	e	m	-	ɛ	n	ʧ	-	ɛ
s	e	m	-	e	n	t	-	e

0.0130 (0.545)								
s	eː	m	-	e	n	t	i	a
s	ə	m	-	ɨ	n	ʦ	-	ə
s	ɨ	m	-	-	ẽ	t	-	ɨ
s	i	m	j	e	n	t	-	e
s	ə	m	-	e	n	-	-	-
s	ə	m	-	-	ɑ̃	-	-	s
s	i	m	-	-	ẽ	-	-	s
s	e	m	-	ɛ	n	ʧ	-	ɛ
s	e	m	-	e	n	t	-	e

Skin



	0.112						
Latin	p	-	e	l	l	e	m
Romanian	p	j	e	l	-	e	-
Portuguese	p	-	ɛ	-	l	ɨ	-
Spanish	p	j	e	-	l	-	-
Catalan	p	-	e	-	ɣ	-	-
French	p	-	o	-	-	-	-
Walloon	p	-	ɛ	-	-	-	-
Friulian	p	j	ɛ	-	l	-	-
Italian	p	-	ɛ	l	l	e	-

	0.108 (0.220)						
Latin	p	-	e	l	l	e	m
Romanian	p	j	e	-	l	e	-
Portuguese	p	-	ɛ	l	-	ɨ	-
Spanish	p	j	e	l	-	-	-
Catalan	p	-	e	ɣ	-	-	-
French	p	-	o	-	-	-	-
Walloon	p	-	ɛ	-	-	-	-
Friulian	p	j	ɛ	l	-	-	-
Italian	p	-	ɛ	l	l	e	-

	0.102 (0.322)						
Latin	p	-	e	l	l	e	m
Romanian	p	j	e	l	-	e	-
Portuguese	p	-	ɛ	l	-	ɨ	-
Spanish	p	j	e	l	-	-	-
Catalan	p	-	e	ɣ	-	-	-
French	p	-	o	-	-	-	-
Walloon	p	-	ɛ	-	-	-	-
Friulian	p	j	ɛ	l	-	-	-
Italian	p	-	ɛ	l	l	e	-

	0.0973 (0.420)						
Latin	p	-	e	l	l	e	m
Romanian	p	j	e	-	l	e	-
Portuguese	p	-	ɛ	-	l	ɨ	-
Spanish	p	j	e	-	l	-	-
Catalan	p	-	e	-	ɣ	-	-
French	p	-	o	-	-	-	-
Walloon	p	-	ɛ	-	-	-	-
Friulian	p	j	ɛ	-	l	-	-
Italian	p	-	ɛ	l	l	e	-

0.0367 (0.456)							
p	-	e	l	-	l	e	m
p	j	e	-	-	l	e	-
p	-	ɛ	l	ɨ	-	-	-
p	j	e	l	-	-	-	-
p	-	e	ɣ	-	-	-	-
p	-	o	-	-	-	-	-
p	-	ɛ	-	-	-	-	-
p	j	ɛ	l	-	-	-	-
p	-	ɛ	l	-	l	e	-

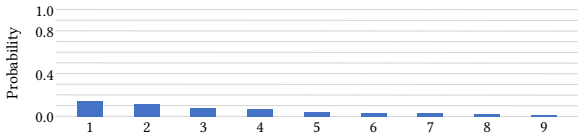
0.0239 (0.480)							
p	-	e	l	-	l	e	m
p	j	e	l	-	-	e	-
p	-	ɛ	l	ɨ	-	-	-
p	j	e	l	-	-	-	-
p	-	e	ɣ	-	-	-	-
p	-	o	-	-	-	-	-
p	-	ɛ	-	-	-	-	-
p	j	ɛ	l	-	-	-	-
p	-	ɛ	l	-	l	e	-

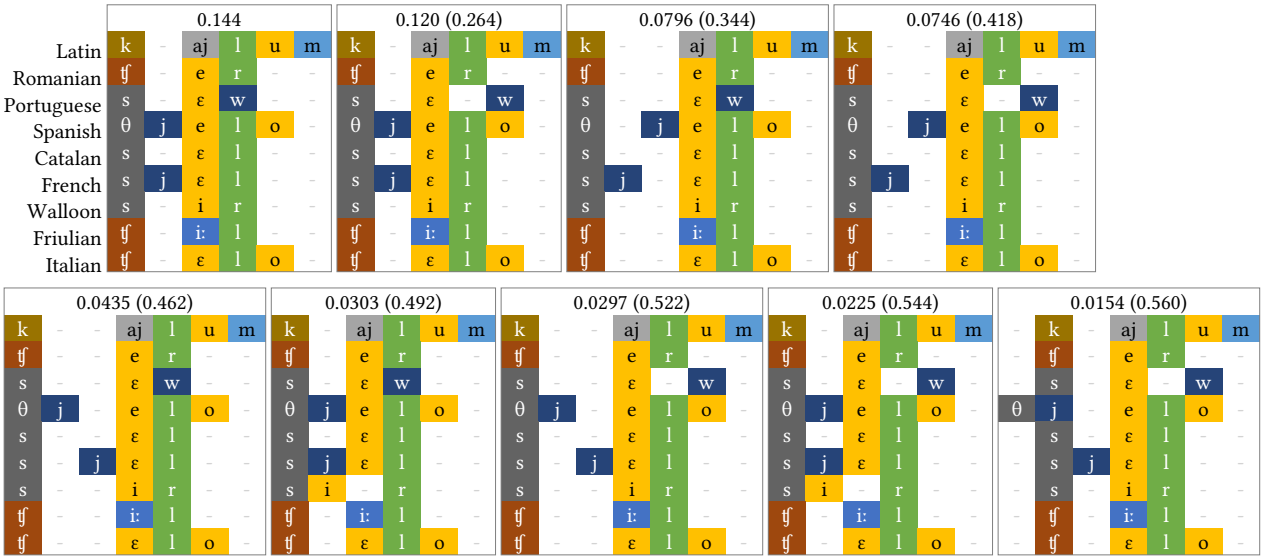
0.0225 (0.502)							
p	-	e	l	l	e	-	m
p	j	e	l	-	e	-	-
p	-	ɛ	-	l	-	ɨ	-
p	j	e	-	l	-	-	-
p	-	e	-	ɣ	-	-	-
p	-	o	-	-	-	-	-
p	-	ɛ	-	-	-	-	-
p	j	ɛ	-	l	-	-	-
p	-	ɛ	l	l	e	-	-

0.0215 (0.524)							
p	-	e	l	l	-	e	m
p	j	e	-	l	-	e	-
p	-	ɛ	-	l	ɨ	-	-
p	j	e	-	l	-	-	-
p	-	e	-	ɣ	-	-	-
p	-	o	-	-	-	-	-
p	-	ɛ	-	-	-	-	-
p	j	ɛ	-	l	-	-	-
p	-	ɛ	l	l	-	e	-

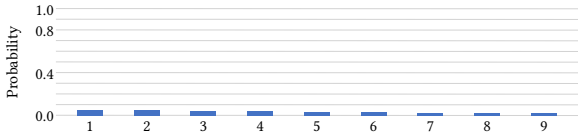
0.0177 (0.542)						
p	e	-	l	l	e	m
p	j	e	-	l	e	-
p	-	ɛ	-	l	ɨ	-
p	j	e	-	l	-	-
p	-	e	-	ɣ	-	-
p	-	o	-	-	-	-
p	-	ɛ	-	-	-	-
p	j	ɛ	-	l	-	-
p	-	ɛ	l	l	e	-

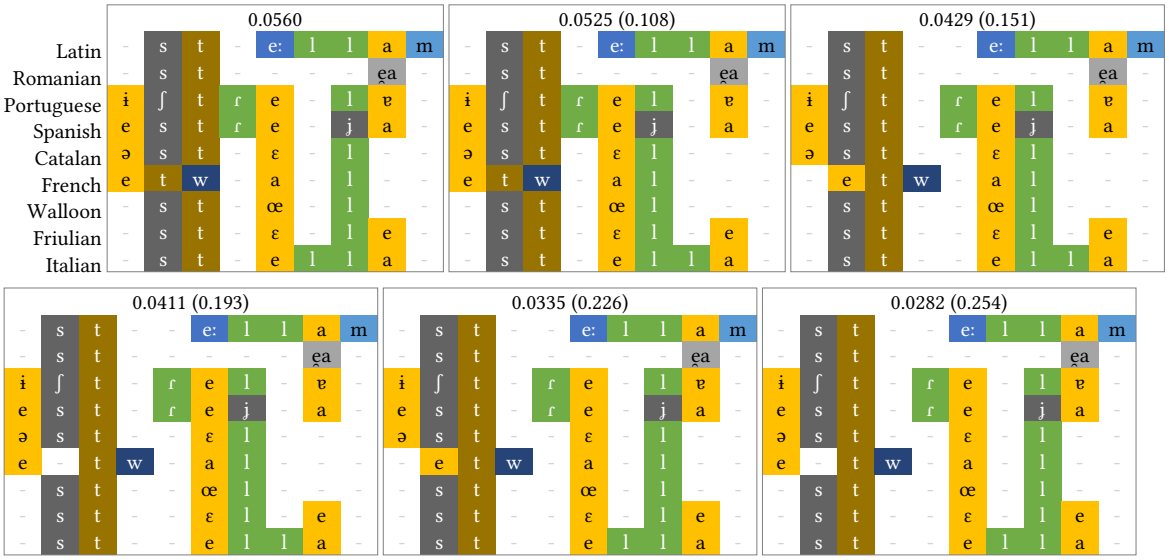
Sky

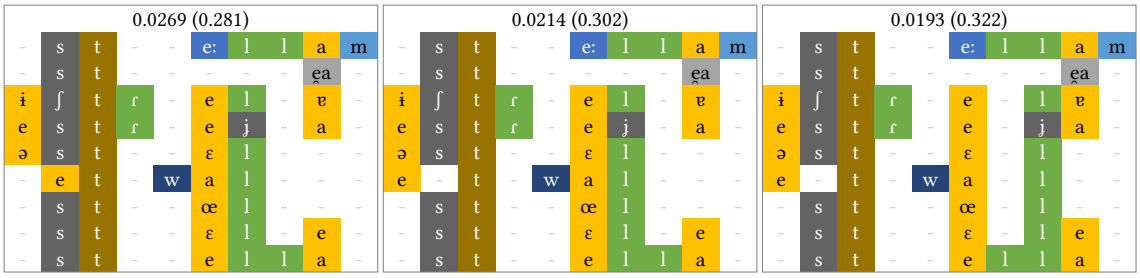

Probability
1.0
0.8
0.4
0.0
1
2
3
4
5
6
7
8
9


0.144
0.120 (0.264)
0.0796 (0.344)
0.0746 (0.418)
0.0435 (0.462)
0.0303 (0.492)
0.0297 (0.522)
0.0225 (0.544)
0.0154 (0.560)
Latin
Romanian
Portuguese
Spanish
Catalan
French
Walloon
Friulian
Italian

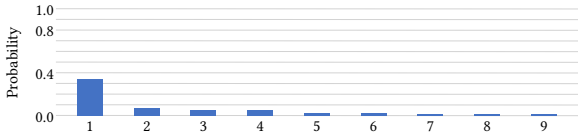
Star

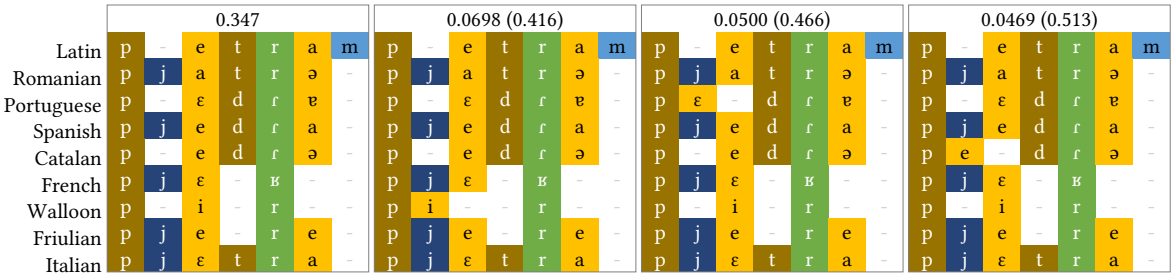

Probability
1.0
0.8
0.4
0.0
1
2
3
4
5
6
7
8
9

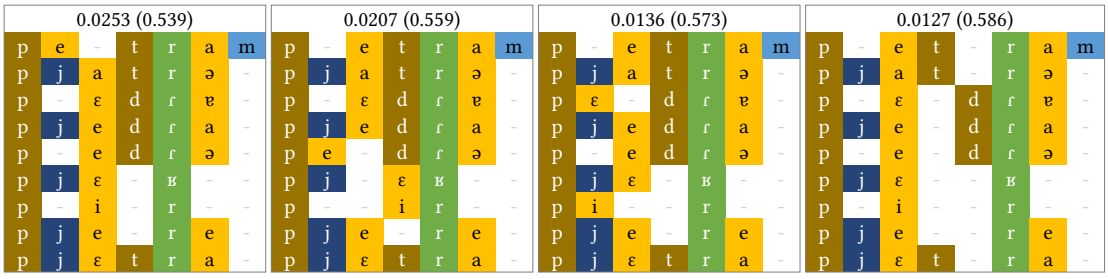

0.0560
0.0525 (0.108)
0.0429 (0.151)
0.0411 (0.193)
0.0335 (0.226)
0.0282 (0.254)
Latin
Romanian
Portuguese
Spanish
Catalan
French
Walloon
Friulian
Italian

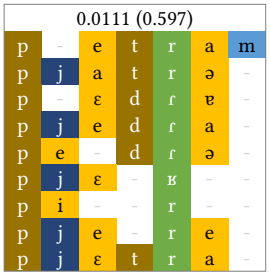

0.0269 (0.281)
0.0214 (0.302)
0.0193 (0.322)

Stone

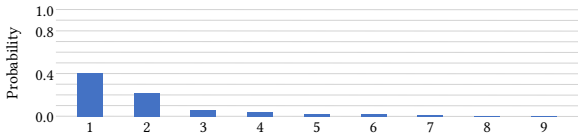

Probability
1.0
0.8
0.4
0.0
1
2
3
4
5
6
7
8
9


0.347
0.0698 (0.416)
0.0500 (0.466)
0.0469 (0.513)
Latin
Romanian
Portuguese
Spanish
Catalan
French
Walloon
Friulian
Italian


0.0253 (0.539)
0.0207 (0.559)
0.0136 (0.573)
0.0127 (0.586)


0.0111 (0.597)

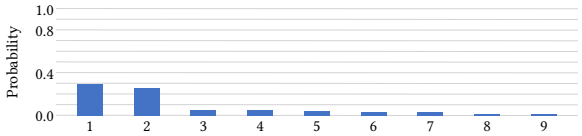
Tail



	0.409	0.216 (0.625)	0.0576 (0.682)	0.0464 (0.729)	0.0275 (0.756)
Latin	k au̯ d a m	k au̯ d a m	k au̯ d - a m	k au̯ - d a m	k au̯ - d a m
Romanian	k o̯a d ə -	k o̯a d ə -	k o̯a d - ə -	k o̯a - d ə -	k o̯a - d ə -
Portuguese	k au̯ d ɐ -	k au̯ d ɐ -	k au̯ d - ɐ -	k au̯ - d ɐ -	k au̯ - d ɐ -
Spanish	k o l a -	k o l a -	k o - l a -	k o l - a -	k o l - a -
Catalan	k u - ə -	k u - ə -	k u - - ə -	k u - - ə -	k u - - ə -
French	k ø - - -	k - - ø -	k ø - - - -	k ø - - - -	k - - - ø -
Walloon	k ɔ - w -	k ɔ - w -	k ɔ - - w -	k ɔ - - w -	k ɔ - - w -
Friulian	k ɔ d ɛ -	k ɔ d ɛ -	k ɔ d - ɛ -	k ɔ - d ɛ -	k ɔ - d ɛ -
Italian	k o d a -	k o d a -	k o d - a -	k o - d a -	k o - d a -

	0.0240 (0.780)	0.0155 (0.796)	0.00677 (0.802)	0.00531 (0.808)
Latin	k au̯ d - a m	k au̯ d a m	k - au̯ d a m	k au̯ - d a m
Romanian	k o̯a d - ə -	k o̯a d ə -	k o̯a - d ə -	k - o̯a d ə -
Portuguese	k au̯ d - ɐ -	k au̯ d ɐ -	k - au̯ d ɐ -	k au̯ - d ɐ -
Spanish	k o - l a -	k o l a -	k - o l a -	k o - l a -
Catalan	k u - - ə -	k u ə - -	k - u - ə -	k u - - ə -
French	k - - - ø -	k ø - - -	k - ø - - -	k ø - - - -
Walloon	k ɔ - - w -	k ɔ w - -	k - ɔ - w -	k ɔ - - w -
Friulian	k ɔ d - ɛ -	k ɔ d ɛ -	k - ɔ d ɛ -	k ɔ - d ɛ -
Italian	k o d - a -	k o d a -	k - o d a -	k o - d a -

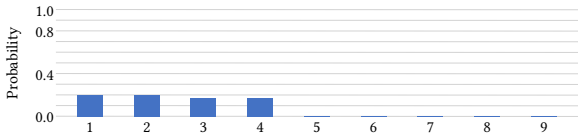
There



	0.299	0.262 (0.561)	0.0544 (0.615)	0.0528 (0.668)	0.0392 (0.707)
Latin	i l l a: k	i l l a: k	i - l l a: k	i - l l a: k	- i l l a: k
Romanian	- l - a -	- - l a -	- - l - a -	- - - l a -	- - l - a -
Portuguese	- l - a -	- - l a -	- - l - a -	- - - l a -	- - l - a -
Spanish	a j - a -	a - j a -	- a j - a -	- a - j a -	a - j - a -
Catalan	ə ɣ - a -	ə - ɣ a -	- ə ɣ - a -	- ə - ɣ a -	ə - ɣ - a -
French	- l - a -	- - l a -	- - l - a -	- - - l a -	- - l - a -
Walloon	- l - a -	- - l a -	- - l - a -	- - - l a -	- - l - a -
Friulian	- l - a -	- - l a -	- - l - a -	- - - l a -	- - l - a -
Italian	- l - a -	- - l a -	- - l - a -	- - - l a -	- - l - a -

	0.0314 (0.739)	0.0304 (0.769)	0.0143 (0.783)	0.0105 (0.794)
Latin	i l - l a: k	- i l l a: k	i - - l l a: k	- - i l l a: k
Romanian	- - - l a -	- - - l a -	- - - l - a -	- - - l - a -
Portuguese	- - - l a -	- - - l a -	- - - l - a -	- - - l - a -
Spanish	- - a j a -	a - - j a -	- a - j - a -	a - - j - a -
Catalan	- - ə ɣ a -	ə - - ɣ a -	- - ə ɣ - a -	- ə - ɣ - a -
French	- - - l a -	- - - l a -	- - - l - a -	- - - l - a -
Walloon	- - - l a -	- - - l a -	- - - l - a -	- - - l - a -
Friulian	- - - l a -	- - - l a -	- - - l - a -	- - - l - a -
Italian	- - - l a -	- - - l a -	- - - l - a -	- - - l - a -

Thick

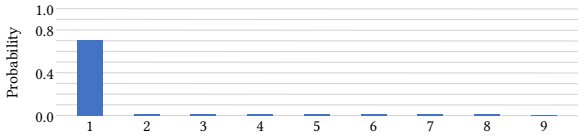


	0.199							0.198 (0.398)							0.175 (0.573)							0.170 (0.742)						
Latin	k	r	a	s	s	u	m	k	r	a	s	s	u	m	k	r	a	s	s	u	m	k	r	a	s	s	u	m
Romanian	g	r	a	s	-	-	-	g	r	a	-	s	-	-	g	r	a	-	s	-	-	g	r	a	s	-	-	-
Portuguese	g	ɾ	a	-	ʃ	u	-	g	ɾ	a	ʃ	-	u	-	g	ɾ	a	-	ʃ	u	-	g	ɾ	a	ʃ	-	u	-
Spanish	g	ɾ	a	-	s	o	-	g	ɾ	a	s	-	o	-	g	ɾ	a	-	s	o	-	g	ɾ	a	s	-	o	-
Catalan	g	ɾ	a	-	s	-	-	g	ɾ	a	s	-	-	-	g	ɾ	a	-	s	-	-	g	ɾ	a	s	-	-	-
French	g	ʁ	ɑ	-	-	-	-	g	ʁ	ɑ	-	-	-	-	g	ʁ	ɑ	-	-	-	-	g	ʁ	ɑ	-	-	-	-
Walloon	k	r	ɑ	-	-	-	-	k	r	ɑ	-	-	-	-	k	r	ɑ	-	-	-	-	k	r	ɑ	-	-	-	-
Friulian	g	r	a	-	s	-	-	g	r	a	s	-	-	-	g	r	a	-	s	-	-	g	r	a	s	-	-	-
Italian	g	r	a	s	s	o	-	g	r	a	s	s	o	-	g	r	a	s	s	o	-	g	r	a	s	s	o	-

	0.00631 (0.748)							0.00554 (0.754)							0.00551 (0.759)							0.00503 (0.764)						
Latin	k	r	a	s	s	u	m	k	-	r	a	s	s	u	m	-	k	r	a	s	s	u	m	k	-	r	a	s	s	u	m
Romanian	g	r	a	s	-	-	-	-	g	r	a	-	s	-	-	g	-	r	a	-	s	-	-	-	g	r	a	-	s	-	-
Portuguese	g	ɾ	a	ʃ	-	u	-	-	g	ɾ	a	ʃ	-	u	-	g	-	ɾ	a	ʃ	-	u	-	-	g	ɾ	a	-	ʃ	u	-
Spanish	g	ɾ	a	s	-	o	-	-	g	ɾ	a	s	-	o	-	g	-	ɾ	a	s	-	o	-	-	g	ɾ	a	-	s	o	-
Catalan	g	ɾ	a	s	-	-	-	-	g	ɾ	a	s	-	-	-	g	-	ɾ	a	s	-	-	-	-	g	ɾ	a	-	s	-	-
French	g	ʁ	-	-	-	ɑ	-	-	g	ʁ	ɑ	-	-	-	-	g	-	ʁ	ɑ	-	-	-	-	-	g	ʁ	ɑ	-	-	-	-
Walloon	k	r	-	-	-	ɑ	-	-	k	r	ɑ	-	-	-	-	k	-	r	ɑ	-	-	-	-	-	k	r	ɑ	-	-	-	-
Friulian	g	r	a	s	-	-	-	-	g	r	a	s	-	-	-	g	-	r	a	s	-	-	-	-	g	r	a	-	s	-	-
Italian	g	r	a	s	s	o	-	-	g	r	a	s	s	o	-	g	-	r	a	s	s	o	-	-	g	r	a	s	s	o	-

	0.00480 (0.769)						
Latin	-	k	r	a	s	s	u	m
Romanian	g	-	r	a	-	s	-	-
Portuguese	g	-	ɾ	a	-	ʃ	u	-
Spanish	g	-	ɾ	a	-	s	o	-
Catalan	g	-	ɾ	a	-	s	-	-
French	g	-	ʁ	ɑ	-	-	-	-
Walloon	k	-	r	ɑ	-	-	-	-
Friulian	g	-	r	a	-	s	-	-
Italian	g	-	r	a	s	s	o	-

Thin



	0.706								0.0128 (0.719)								0.0124 (0.731)								
Latin	m	i	n	uː	-	t	u	m	m	i	n	-	uː	-	t	u	m	m	i	n	uː	-	t	-	u	m
Romanian	m	ə	n	u	n	t	-	-	m	ə	n	u	-	n	t	-	-	m	ə	n	u	n	t	-	-	-
Portuguese	m	i	-	u	-	d	u	-	m	i	-	u	-	-	d	u	-	m	i	-	u	-	-	d	u	-
Spanish	m	e	n	u	-	d	o	-	m	e	n	u	-	-	d	o	-	m	e	n	u	-	-	d	o	-
Catalan	m	ə	n	u	-	t	-	-	m	ə	n	u	-	-	t	-	-	m	ə	n	u	-	t	-	-	-
French	m	ə	n	y	-	-	-	-	m	ə	n	y	-	-	-	-	-	m	ə	n	y	-	-	-	-	-
Walloon	m	œ	n	u	-	-	-	-	m	œ	n	u	-	-	-	-	-	m	œ	n	u	-	-	-	-	-
Friulian	m	i	n	uː	-	t	-	-	m	i	n	uː	-	-	t	-	-	m	i	n	uː	-	t	-	-	-
Italian	m	i	n	u	-	t	o	-	m	i	n	u	-	-	t	o	-	m	i	n	u	-	t	-	o	-

0.0117 (0.743)

m	i	n	uː	-	t	u	-	m
m	ə	n	u	n	t	-	-	-
m	i	-	u	-	d	-	u	-
m	e	n	u	-	d	-	o	-
m	ə	n	u	-	t	-	-	-
m	ə	n	y	-	-	-	-	-
m	œ	n	u	-	-	-	-	-
m	i	n	uː	-	t	-	-	-
m	i	n	u	-	t	-	o	-

0.0116 (0.754)

m	i	n	uː	-	-	t	u	m
m	ə	n	-	u	n	t	-	-
m	i	-	-	u	-	d	u	-
m	e	n	-	u	-	d	o	-
m	ə	n	-	u	-	t	-	-
m	ə	n	-	y	-	-	-	-
m	œ	n	-	u	-	-	-	-
m	i	n	-	uː	-	t	-	-
m	i	n	-	u	-	t	o	-

0.00989 (0.764)

m	i	n	uː	-	-	t	u	m
m	ə	n	u	n	-	t	-	-
m	i	-	u	-	d	-	u	-
m	e	n	u	-	d	-	o	-
m	ə	n	u	-	-	t	-	-
m	ə	n	y	-	-	-	-	-
m	œ	n	u	-	-	-	-	-
m	i	n	uː	-	-	t	-	-
m	i	n	u	-	-	t	o	-

0.00963 (0.774)

m	i	n	uː	-	t	-	u	m
m	ə	n	u	n	t	-	-	-
m	i	-	u	-	d	u	-	-
m	e	n	u	-	d	o	-	-
m	ə	n	u	-	t	-	-	-
m	ə	n	y	-	-	-	-	-
m	œ	n	u	-	-	-	-	-
m	i	n	uː	-	t	-	-	-
m	i	n	u	-	t	o	-	-

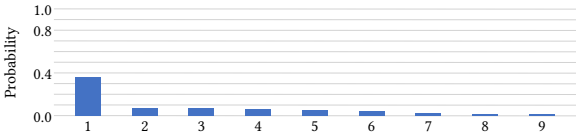
0.00957 (0.783)

m	-	i	n	uː	-	t	u	m
m	ə	-	n	u	n	t	-	-
m	-	i	-	u	-	d	u	-
m	-	e	n	u	-	d	o	-
m	-	ə	n	u	-	t	-	-
m	-	ə	n	y	-	-	-	-
m	-	œ	n	u	-	-	-	-
m	-	i	n	uː	-	t	-	-
m	-	i	n	u	-	t	o	-

0.00834 (0.792)

m	i	n	uː	-	t	u	m	
m	ə	n	u	n	t	-	-	
m	i	-	u	-	d	u	-	
m	e	n	u	-	d	o	-	
m	ə	n	u	-	t	-	-	
m	ə	n	-	-	-	y	-	
m	œ	n	-	-	-	u	-	
m	i	n	uː	-	t	-	-	
m	i	n	u	-	t	o	-	

Three



	0.364	0.0736 (0.438)	0.0692 (0.507)	0.0615 (0.568)	0.0476 (0.616)	0.0395 (0.656)	0.0206 (0.676)
Latin	t r eː s	t r eː s -	t r eː s -	t r eː s	t r eː - s	t r - eː s	t r eː s
Romanian	t r ej -	t r ej - -	t r ej - -	t r - ej	t r ej - -	t r - ej -	t r ej -
Portuguese	t ɾ e ʃ	t ɾ e ʃ -	t ɾ e ʃ -	t ɾ e ʃ	t ɾ e - ʃ	t ɾ - e ʃ	t ɾ e ʃ
Spanish	t ɾ e s	t ɾ e s -	t ɾ e s -	t ɾ e s	t ɾ e - s	t ɾ - e s	t ɾ e s
Catalan	t r ɛ s	t r ɛ s -	t r ɛ s -	t r ɛ s	t r ɛ - s	t r - ɛ s	t r ɛ s
French	t ʁ w ɑ	t ʁ - w ɑ	t ʁ w - ɑ	t ʁ w ɑ	t ʁ w ɑ -	t ʁ w ɑ -	t ʁ w ɑ
Walloon	t r ø s	t r ø s -	t r ø s -	t r ø s	t r ø - s	t r - ø s	t r ø s
Friulian	t r eː -	t r eː - -	t r eː - -	t r eː -	t r eː - -	t r - eː -	t r - eː
Italian	t r e -	t r e - -	t r e - -	t r e -	t r e - -	t r - e -	t r e -

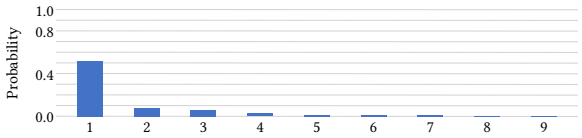
0.0167 (0.693)

t	r	eː	-	-	s
t	r	ej	-	-	-
t	ɾ	e	ʃ	-	-
t	ɾ	e	s	-	-
t	r	ɛ	s	-	-
t	ʁ	w	-	ɑ	-
t	r	ø	s	-	-
t	r	eː	-	-	-
t	r	e	-	-	-

0.0123 (0.705)

t	r	eː	-	-	s
t	r	ej	-	-	-
t	ɾ	e	ʃ	-	-
t	ɾ	e	s	-	-
t	r	ɛ	s	-	-
t	ʁ	-	w	ɑ	-
t	r	ø	s	-	-
t	r	eː	-	-	-
t	r	e	-	-	-

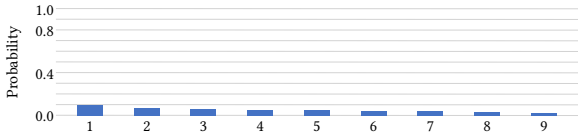
ToCome



	0.519	0.0782 (0.597)	0.0563 (0.653)	0.0277 (0.681)	0.0159 (0.697)
Latin	w e n iː r e	w e n iː r e	w e n iː r e	w e n iː r e	w - e n iː r e
Romanian	v e n i - -	v e n - - i	v e n i - -	v e n i - -	- v e n i - -
Portuguese	v - - i ɾ -	v - - i ɾ -	v i - - ɾ -	v - - i ɾ -	- v - - i ɾ -
Spanish	b e n i ɾ -	b e n i ɾ -	b e n i ɾ -	b e n i ɾ -	- b e n i ɾ -
Catalan	b ə n i - -	b ə n i - -	b ə n i - -	b ə n i - -	- b ə n i - -
French	v ə n i ʁ -	v ə n i ʁ -	v ə n i ʁ -	v ə n i ʁ -	- v ə n i ʁ -
Walloon	v i n i - -	v i n i - -	v i n i - -	v i n i - -	- v i n i - -
Friulian	v i ɲ iː - -	v i ɲ iː - -	v i ɲ iː - -	v i ɲ - iː -	- v i ɲ iː - -
Italian	v e n i r e	v e n i r e	v e n i r e	v e n i r e	- v e n i r e

0.0132 (0.710)	0.0106 (0.721)	0.00831 (0.729)	0.00769 (0.737)
- w e n iː r e	w e n iː - r e	w e n iː r e	w e n iː r e -
v - e n i - -	v e n - i - -	v e n - - i	v e n i - - -
v - - - i ɾ -	v - - - i ɾ -	v i - - ɾ -	v - - i - - ɾ
b - e n i ɾ -	b e n - i ɾ -	b e n i ɾ -	b e n i - - ɾ
b - ə n i - -	b ə n - i - -	b ə n i - -	b ə n i - - -
v - ə n i ʁ -	v ə n - i ʁ -	v ə n i ʁ -	v ə n i - - ʁ
v - i n i - -	v i n - i - -	v i n i - -	v i n i - - -
v - i ɲ iː - -	v i ɲ - iː - -	v i ɲ iː - -	v i ɲ iː - - -
v - e n i r e	v e n - i r e	v e n i r e	v e n i r e -

ToCut

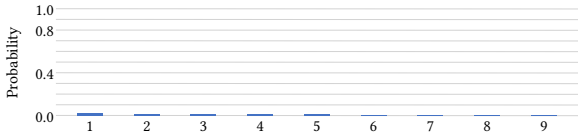


	0.0987	0.0704 (0.169)	0.0639 (0.233)	0.0527 (0.286)
Latin	t a l i aː r e	t a l - i aː r e	t a - l i aː r e	t a l i aː r e
Romanian	t ə - j a - -	t ə j - - a - -	t ə - j - a - -	t ə - j a - -
Portuguese	t ɐ - ɟ a ɾ -	t ɐ ɟ - - a ɾ -	t ɐ - ɟ - a ɾ -	t ɐ ɟ - a ɾ -
Spanish	t a - x a ɾ -	t a x - - a ɾ -	t a - x - a ɾ -	t a x - a ɾ -
Catalan	t ə - ɟ a - -	t ə ɟ - - a - -	t ə - ɟ - a - -	t ə ɟ - a - -
French	t ɑ - j e - -	t ɑ j - - e - -	t ɑ - j - e - -	t ɑ j - e - -
Walloon	t ɛ - j i - -	t ɛ j - - i - -	t ɛ - j - i - -	t ɛ j - i - -
Friulian	t a - j aː - -	t a j - - aː - -	t a - j - aː - -	t a j - aː - -
Italian	t a ɟ ɟ a r e	t a ɟ ɟ - a r e	t a ɟ ɟ - a r e	t a ɟ ɟ a r e

0.0504 (0.336)	0.0415 (0.378)	0.0398 (0.417)	0.0285 (0.446)
t a - l i aː r e	t a l i - aː r e	t a l - i aː r e	t a l i aː r e
t ə - j a - - -	t ə j - - a - -	t ə j - a - - -	t ə j - a - -
t ɐ - ɟ a - ɾ -	t ɐ ɟ - - a ɾ -	t ɐ ɟ - a - ɾ -	t ɐ ɟ - a ɾ -
t a - x a - ɾ -	t a x - - a ɾ -	t a x - a - ɾ -	t a x - a ɾ -
t ə - ɟ a - - -	t ə ɟ - - a - -	t ə ɟ - a - - -	t ə ɟ - a - -
t ɑ - j e - - -	t ɑ j - - e - -	t ɑ j - e - - -	t ɑ j - e - -
t ɛ - j i - - -	t ɛ j - - i - -	t ɛ j - i - - -	t ɛ j - i - -
t a - j aː - - -	t a j - - aː - -	t a j - aː - - -	t a j - aː - -
t a ɟ ɟ a - r e	t a ɟ - ɟ a r e	t a ɟ ɟ a - r e	t a ɟ ɟ a r e

0.0245 (0.470)						
t	a	l̪	i	aː	r	e
t	ə	j	-	a	-	-
t	ɐ	-	ɣ	a	ɾ	-
t	a	-	x	a	ɾ	-
t	ə	-	ɣ	a	-	-
t	ɑ	-	j	e	-	-
t	ɛ	-	j	i	-	-
t	a	-	j	aː	-	-
t	a	ɣ	ɣ	a	r	e

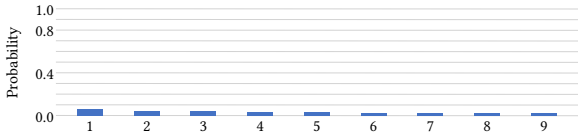
ToDrink



	0.0187								0.0143 (0.0331)								0.0111 (0.0442)								0.0105 (0.0547)							
Latin	b	i	b	e	r	e	-	-	b	i	b	e	r	e	-	-	b	i	b	e	r	e	-	-	b	i	b	e	r	e	-	-
Romanian	-	-	b	-	-	ɐ̯a	-	-	-	-	b	-	-	ɐ̯a	-	-	b	-	-	-	-	ɐ̯a	-	-	b	-	-	-	-	ɐ̯a	-	-
Portuguese	-	-	b	ɨ	b	e	ɾ	-	-	-	b	ɨ	b	e	ɾ	-	b	ɨ	b	-	-	e	ɾ	-	b	-	-	ɨ	b	e	ɾ	-
Spanish	-	-	b	e	b	e	ɾ	-	-	-	b	e	b	e	ɾ	-	b	e	b	-	-	e	ɾ	-	b	-	-	e	b	e	ɾ	-
Catalan	-	-	b	ɛ	-	w	ɾ	ə	-	-	b	ɛ	-	w	ɾ	ə	b	ɛ	w	-	ɾ	ə	-	-	b	-	-	ɛ	-	w	ɾ	ə
French	-	-	b	w	-	ɑ	ʁ	-	-	-	b	w	-	ɑ	ʁ	-	b	-	w	-	-	ɑ	ʁ	-	b	-	-	w	-	ɑ	ʁ	-
Walloon	-	-	b	ø	-	-	ʁ	-	-	-	b	-	-	ø	ʁ	-	b	-	-	-	-	ø	ʁ	-	b	-	-	-	-	ø	ʁ	-
Friulian	-	-	b	e	v	i	-	-	-	-	b	e	v	i	-	-	b	e	v	-	-	i	-	-	b	-	-	e	v	i	-	-
Italian	-	-	b	e	r	e	-	-	-	-	b	e	r	e	-	-	b	e	-	-	r	e	-	-	b	-	-	e	r	e	-	-

	0.00960 (0.0643)								0.00846 (0.0727)								0.00837 (0.0811)								0.00754 (0.0886)								0.00700 (0.0956)							
Latin	b	i	b	e	r	e	-	-	b	i	b	e	r	e			b	i	b	e	r	e	-		b	i	b	e	r	e	-	-	b	i	b	e	r	e		
Romanian	b	-	-	-	-	ɐ̯a	-	-	b	-	-	-	-	ɐ̯a			-	-	b	ɐ̯a	-	-	-		-	-	b	ɐ̯a	-	-	-	-	-	-	b	-	-	ɐ̯a		
Portuguese	b	-	-	ɨ	b	e	ɾ	-	b	ɨ	b	e	ɾ	-			b	ɨ	b	e	ɾ	-	-		-	-	b	ɨ	b	e	ɾ	-	b	ɨ	b	e	ɾ	-		
Spanish	b	-	-	e	b	e	ɾ	-	b	e	b	e	ɾ	-			b	e	b	e	ɾ	-	-		-	-	b	e	b	e	ɾ	-	b	e	b	e	ɾ	-		
Catalan	b	-	-	ɛ	-	w	ɾ	ə	b	ɛ	-	w	ɾ	ə			b	ɛ	-	w	ɾ	-	ə		-	-	b	ɛ	-	w	ɾ	ə	b	ɛ	-	w	ɾ	ə		
French	b	-	-	w	-	ɑ	ʁ	-	b	w	-	ɑ	ʁ	-			b	w	-	ɑ	ʁ	-	-		-	-	b	w	-	ɑ	ʁ	-	b	w	-	ɑ	ʁ	-		
Walloon	b	-	-	ø	-	-	ʁ	-	b	-	-	ø	ʁ	-			b	-	-	ø	ʁ	-	-		-	-	b	-	-	ø	ʁ	-	b	-	-	ø	ʁ	-		
Friulian	b	-	-	e	v	i	-	-	b	e	v	i	-	-			b	e	v	i	-	-	-		-	-	b	e	v	i	-	-	b	e	v	i	-	-		
Italian	b	-	-	e	r	e	-	-	b	e	-	-	r	e			b	e	r	e	-	-	-		-	-	b	e	r	e	-	-	b	-	-	e	r	e		

ToFall



	0.0626						0.0450 (0.108)							0.0399 (0.147)						0.0363 (0.184)						0.0358 (0.220)						
Latin	k	a	d	e	r	e	k	a	d	e	r	e	-	k	a	d	e	r	e	k	a	d	e	r	e	k	a	d	e	r	e	-
Romanian	k	ə	d	-	-	ɐ̯a	k	ə	d	-	-	ɐ̯a	-	k	ə	d	ɐ̯a	-	-	k	ə	d	ɐ̯a	-	-	k	ə	d	ɐ̯a	-	-	-
Portuguese	k	ɐ	-	i	ɾ	-	k	ɐ	-	i	ɾ	-	-	k	ɐ	-	i	ɾ	-	k	ɐ	-	i	ɾ	-	k	ɐ	-	i	ɾ	-	-
Spanish	k	a	-	e	ɾ	-	k	a	-	e	ɾ	-	-	k	a	-	e	ɾ	-	k	a	-	e	ɾ	-	k	a	-	e	ɾ	-	-
Catalan	k	a	-	w	ɾ	ə	k	a	-	w	ɾ	-	ə	k	a	-	w	ɾ	ə	k	a	-	w	ɾ	ə	k	a	-	w	ɾ	-	ə
French	ʃ	w	-	a	ʁ	-	ʃ	w	-	a	ʁ	-	-	ʃ	w	-	a	ʁ	-	ʃ	w	-	a	ʁ	-	ʃ	w	-	a	ʁ	-	-
Walloon	ʧ	-	-	ɛ	r	-	ʧ	-	-	ɛ	r	-	-	ʧ	-	-	ɛ	r	-	ʧ	-	-	ɛ	r	-	ʧ	-	-	ɛ	r	-	-
Friulian	c	a	d	-	-	e	c	a	d	e	-	-	-	c	a	d	e	-	-	c	a	d	-	-	e	c	a	d	e	-	-	-
Italian	k	a	d	e	r	e	k	a	d	e	r	e	-	k	a	d	e	r	e	k	a	d	e	r	e	k	a	d	e	r	e	-

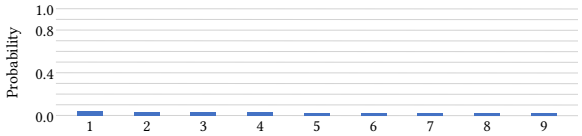
0.0274 (0.247)					
k	a	d	e	r	e
k	ə	d	-	-	ɐa
k	ɐ	-	i	ɾ	-
k	a	-	e	ɾ	-
k	a	-	w	ɾ	ə
ʃ	w	-	a	ʁ	-
ʧ	-	-	ɛ	r	-
c	a	d	e	-	-
k	a	d	e	r	e

0.0241 (0.271)					
k	a	d	e	r	e
k	ə	d	-	-	ɐa
k	ɐ	-	i	ɾ	-
k	a	-	e	ɾ	-
k	a	-	w	ɾ	ə
ʃ	w	-	a	ʁ	-
ʧ	ɛ	-	-	r	-
c	a	d	-	-	e
k	a	d	e	r	e

0.0225 (0.294)						
k	a	d	e	r	e	-
k	ə	d	ɐa	-	-	-
k	ɐ	-	i	ɾ	-	-
k	a	-	e	ɾ	-	-
k	a	-	w	ɾ	-	ə
ʃ	w	-	a	ʁ	-	-
ʧ	ɛ	-	-	r	-	-
c	a	d	e	-	-	-
k	a	d	e	r	e	-

0.0225 (0.316)					
k	a	d	e	r	e
k	ə	d	-	-	ɐa
k	ɐ	-	i	ɾ	-
k	a	-	e	ɾ	-
k	a	-	w	ɾ	ə
ʃ	w	-	a	ʁ	-
ʧ	-	-	ɛ	r	-
c	a	-	-	d	e
k	a	d	e	r	e

ToFight



	0.0421						
Latin	b	a	t	t	e	r	e
Romanian	b	a	t	-	-	-	e
Portuguese	b	ɐ	-	t	e	ɾ	-
Spanish	b	a	-	t	i	ɾ	-
Catalan	b	a	-	t	-	ɾ	ə
French	b	a	-	t	-	ʁ	-
Walloon	b	a	-	t	-	-	-
Friulian	b	a	-	t	i	-	-
Italian	b	a	t	t	e	r	e

0.0372 (0.0793)						
b	a	t	t	e	r	e
b	a	-	t	-	-	e
b	ɐ	t	-	e	ɾ	-
b	a	t	-	i	ɾ	-
b	a	t	-	-	ɾ	ə
b	a	t	-	-	ʁ	-
b	a	t	-	-	-	-
b	a	t	-	i	-	-
b	a	t	t	e	r	e

0.0361 (0.115)						
b	a	t	t	e	r	e
b	a	t	-	-	-	e
b	ɐ	t	-	e	ɾ	-
b	a	t	-	i	ɾ	-
b	a	t	-	-	ɾ	ə
b	a	t	-	-	ʁ	-
b	a	t	-	-	-	-
b	a	t	-	i	-	-
b	a	t	t	e	r	e

0.0292 (0.145)						
b	a	t	t	e	r	e
b	a	-	t	-	-	e
b	ɐ	-	t	e	ɾ	-
b	a	-	t	i	ɾ	-
b	a	-	t	-	ɾ	ə
b	a	-	t	-	ʁ	-
b	a	-	t	-	-	-
b	a	-	t	i	-	-
b	a	t	t	e	r	e

0.0268 (0.171)						
b	a	t	t	e	r	e
b	a	t	-	e	-	-
b	ɐ	-	t	e	ɾ	-
b	a	-	t	i	ɾ	-
b	a	-	t	-	ɾ	ə
b	a	-	t	-	ʁ	-
b	a	-	t	-	-	-
b	a	-	t	i	-	-
b	a	t	t	e	r	e

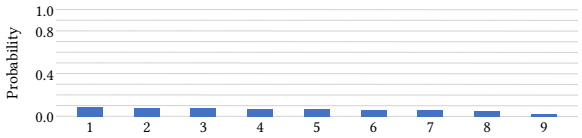
0.0231 (0.194)						
b	a	t	t	e	r	e
b	a	-	t	e	-	-
b	ɐ	-	t	e	ɾ	-
b	a	-	t	i	ɾ	-
b	a	-	t	-	ɾ	ə
b	a	-	t	-	ʁ	-
b	a	-	t	-	-	-
b	a	-	t	i	-	-
b	a	t	t	e	r	e

0.0220 (0.216)						
b	a	t	t	e	r	e
b	a	t	-	-	-	e
b	ɐ	t	-	e	ɾ	-
b	a	t	-	i	ɾ	-
b	a	t	-	-	ɾ	-
b	a	t	-	-	ʁ	-
b	a	t	-	-	-	-
b	a	t	-	i	-	-
b	a	t	t	e	r	e

0.0220 (0.238)						
b	a	t	t	e	r	e
b	a	t	-	e	-	-
b	ɐ	t	-	e	ɾ	-
b	a	t	-	i	ɾ	-
b	a	t	-	-	ɾ	ə
b	a	t	-	-	ʁ	-
b	a	t	-	-	-	-
b	a	t	-	i	-	-
b	a	t	t	e	r	e

0.0209 (0.259)						
b	a	t	t	e	r	e
b	a	-	t	e	-	-
b	ɐ	t	-	e	ɾ	-
b	a	t	-	i	ɾ	-
b	a	t	-	-	ɾ	ə
b	a	t	-	-	ʁ	-
b	a	t	-	-	-	-
b	a	t	-	i	-	-
b	a	t	t	e	r	e

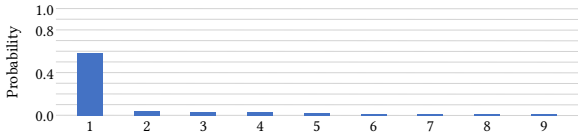
ToFlow



	0.0849	0.0788 (0.164)	0.0782 (0.242)	0.0742 (0.316)
Latin	k u r r e r e	k u r r e r e	k u r r e r e	k u r r e r e
Romanian	k u r ʤ e - -	k u r ʤ e - -	k u r ʤ - - e	k u r - - ʤ e
Portuguese	k u - ʁ e ɾ -	k u ʁ - e ɾ -	k u - ʁ e ɾ -	k u - ʁ e ɾ -
Spanish	k o - r e ɾ -	k o r - e ɾ -	k o - r e ɾ -	k o - r e ɾ -
Catalan	k o - r ə - -	k o r - ə - -	k o - r ə - -	k o - r ə - -
French	k u - ʁ i ʁ -	k u ʁ - i ʁ -	k u - ʁ i ʁ -	k u - ʁ i ʁ -
Walloon	k ɔ - r i - -	k ɔ r - i - -	k ɔ - r i - -	k ɔ - r i - -
Friulian	k ɔ - r i - -	k ɔ r - i - -	k ɔ - r i - -	k ɔ - r i - -
Italian	k o r r e r e	k o r r e r e	k o r r e r e	k o r r e r e

	0.0668 (0.383)	0.0645 (0.447)	0.0575 (0.505)	0.0529 (0.558)	0.0204 (0.578)
Latin	k u r r e r e	k u r r e r e	k u r r e r e	k u r r e r e	k u r r e r e
Romanian	k u - r - ʤ e	k u r ʤ - - e	k u - r - ʤ e	k u r - - ʤ e	k u r - ʤ - e
Portuguese	k u ʁ - e ɾ -	k u ʁ - e ɾ -	k u - ʁ e ɾ -	k u ʁ - e ɾ -	k u - ʁ e ɾ -
Spanish	k o r - e ɾ -	k o r - e ɾ -	k o - r e ɾ -	k o r - e ɾ -	k o - r e ɾ -
Catalan	k o r - ə - -	k o r - ə - -	k o - r ə - -	k o r - ə - -	k o - r ə - -
French	k u ʁ - i ʁ -	k u ʁ - i ʁ -	k u - ʁ i ʁ -	k u ʁ - i ʁ -	k u - ʁ i ʁ -
Walloon	k ɔ r - i - -	k ɔ r - i - -	k ɔ - r i - -	k ɔ r - i - -	k ɔ - r i - -
Friulian	k ɔ r - i - -	k ɔ r - i - -	k ɔ - r i - -	k ɔ r - i - -	k ɔ - r i - -
Italian	k o r r e r e	k o r r e r e	k o r r e r e	k o r r e r e	k o r r e r e

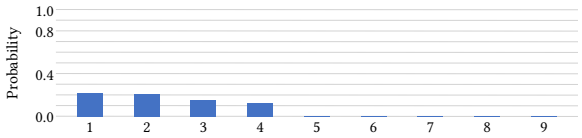
ToHear



	0.582	0.0421 (0.625)	0.0329 (0.657)	0.0289 (0.686)
Latin	aʊ̯ - d iː r e	aʊ̯ - d iː r e	aʊ̯ - - d iː r e	aʊ̯ - - d iː r e
Romanian	aʊ̯ - z i - -	aʊ̯ - z - - i	aʊ̯ - - z i - -	aʊ̯ - - z i - -
Portuguese	o - v i ɾ -	o - v i ɾ -	o - v - i ɾ -	o v - - i ɾ -
Spanish	o - - i ɾ -	o - - i ɾ -	o - - - i ɾ -	o - - - i ɾ -
Catalan	u - - i - -	u - - i - -	u - - - i - -	u - - - i - -
French	u - - i ʁ -	u - - i ʁ -	u - - - i ʁ -	u - - - i ʁ -
Walloon	ɔj - - i - -	ɔj - - i - -	ɔj - - - i - -	ɔj - - - i - -
Friulian	u l d iː - -	u l d iː - -	u l - d iː - -	u - l d iː - -
Italian	u - d i r e	u - d i r e	u - - d i r e	u - - d i r e

	0.0194 (0.706)	0.0177 (0.724)	0.0157 (0.739)	0.0125 (0.752)	0.0108 (0.762)
Latin	aʊ̯ - d - iː r e	aʊ̯ - d iː r e -	aʊ̯ - d iː r e	aʊ̯ - d iː r e	aʊ̯ - d - iː r e
Romanian	aʊ̯ - z - i - -	aʊ̯ - z i - - -	aʊ̯ - - - z i	aʊ̯ - z i - -	aʊ̯ - - z i - -
Portuguese	o - - v i ɾ -	o - v i - - ɾ	o - v i ɾ -	o - v i ɾ -	o - v - i ɾ -
Spanish	o - - - i ɾ -	o - - i - - ɾ	o - - i ɾ -	o - - i ɾ -	o - - - i ɾ -
Catalan	u - - - i - -	u - - i - - -	u - - i - -	u - - i - -	u - - - i - -
French	u - - - i ʁ -	u - - i - - ʁ	u - - i ʁ -	u - - i ʁ -	u - - - i ʁ -
Walloon	ɔj - - - i - -	ɔj - - i - - -	ɔj - - i - -	ɔj - - i - -	ɔj - - - i - -
Friulian	u l d - iː - -	u l d iː - - -	u l d iː - -	u l d - iː -	u l d - iː - -
Italian	u - d - i r e	u - d i r e -	u - d i r e	u - d i r e	u - d - i r e

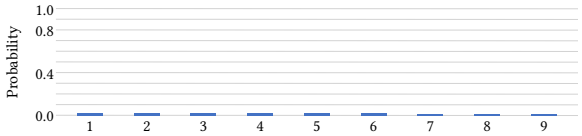
ToHold



	0.218						0.210 (0.428)						0.151 (0.579)						0.127 (0.706)						0.00457 (0.710)					
Latin	t	e	n	eː	r	e	t	e	n	eː	r	e	t	e	n	eː	r	e	t	e	n	eː	r	e	t	e	n	-	eː	r	e
Romanian	ts	i	n	-	-	e	ts	i	n	-	-	e	ts	i	n	e	-	-	ts	i	n	e	-	-	ts	i	n	-	-	-	e
Portuguese	t	e	-	-	ɾ	-	t	-	-	e	ɾ	-	t	e	-	-	ɾ	-	t	-	-	e	ɾ	-	t	-	-	e	-	ɾ	-
Spanish	t	e	n	e	ɾ	-	t	e	n	e	ɾ	-	t	e	n	e	ɾ	-	t	e	n	e	ɾ	-	t	e	n	e	-	ɾ	-
Catalan	t	ə	n	i	-	-	t	ə	n	i	-	-	t	ə	n	i	-	-	t	ə	n	i	-	-	t	ə	n	i	-	-	-
French	t	ə	n	i	ʁ	-	t	ə	n	i	ʁ	-	t	ə	n	i	ʁ	-	t	ə	n	i	ʁ	-	t	ə	n	i	-	ʁ	-
Walloon	t	i	n	i	-	-	t	i	n	i	-	-	t	i	n	i	-	-	t	i	n	i	-	-	t	i	n	i	-	-	-
Friulian	t	i	ɲ	i	-	-	t	i	ɲ	i	-	-	t	i	ɲ	i	-	-	t	i	ɲ	i	-	-	t	i	ɲ	i	-	-	-
Italian	t	e	n	e	r	e	t	e	n	e	r	e	t	e	n	e	r	e	t	e	n	e	r	e	t	e	n	e	-	r	e

	0.00451 (0.715)							0.00431 (0.719)							0.00377 (0.723)							0.00374 (0.727)						
Latin	t	e	n	eː	-	r	e	t	e	n	eː	r	e	-	-	t	e	n	-	eː	r	e	t	e	-	n	eː	r	e
Romanian	ts	i	n	-	-	-	e	ts	i	n	e	-	-	-	-	ts	i	n	-	-	-	e	ts	i	-	n	-	-	e
Portuguese	t	e	-	-	ɾ	-	-	t	e	-	-	-	ɾ	-	-	t	e	-	-	-	ɾ	-	t	e	-	-	-	ɾ	-
Spanish	t	e	n	e	ɾ	-	-	t	e	n	e	-	-	ɾ	-	t	e	n	e	-	ɾ	-	t	e	-	n	e	ɾ	-
Catalan	t	ə	n	i	-	-	-	t	ə	n	i	-	-	-	-	t	ə	n	i	-	-	-	t	ə	-	n	i	-	-
French	t	ə	n	i	ʁ	-	-	t	ə	n	i	-	-	-	ʁ	t	ə	n	i	-	ʁ	-	t	ə	-	n	i	ʁ	-
Walloon	t	i	n	i	-	-	-	t	i	n	i	-	-	-	-	t	i	n	i	-	-	-	t	i	-	n	i	-	-
Friulian	t	i	ɲ	i	-	-	-	t	i	ɲ	i	-	-	-	-	t	i	ɲ	i	-	-	-	t	i	ɲ	-	i	-	-
Italian	t	e	n	e	-	r	e	t	e	n	e	r	e	-	-	t	e	n	e	-	r	e	t	e	-	n	e	r	e

ToKnow



	0.0266										0.0260 (0.0526)										0.0249 (0.0776)									
Latin	k	o	g	n	oː	s	k	e	r	e	k	o	g	n	oː	s	k	e	r	e	k	o	g	n	oː	s	k	e	r	e
Romanian	k	u	-	n	o̯a	ʃ	t	-	-	e	k	u	-	n	o̯a	ʃ	t	-	-	e	k	u	-	n	o̯a	ʃ	t	e	-	-
Portuguese	k	u	-	ɲ	ɨ	-	s	e	ɾ	-	k	u	-	ɲ	ɨ	s	-	e	ɾ	-	k	u	-	ɲ	ɨ	s	-	e	ɾ	-
Spanish	k	o	-	n	o	-	θ	e	ɾ	-	k	o	-	n	o	θ	-	e	ɾ	-	k	o	-	n	o	θ	-	e	ɾ	-
Catalan	k	u	-	n	ɛ	-	ʃ	ə	-	-	k	u	-	n	ɛ	ʃ	-	ə	-	-	k	u	-	n	ɛ	ʃ	-	ə	-	-
French	k	ɔ	-	n	ɛ	-	t	-	ʁ	-	k	ɔ	-	n	ɛ	t	-	ʁ	-	-	k	ɔ	-	n	ɛ	t	-	-	ʁ	-
Walloon	k	i	-	n	ɔ	-	h	-	-	-	k	i	-	n	ɔ	h	-	-	-	-	k	i	-	n	ɔ	h	-	-	-	-
Friulian	k	o	-	ɲ	ɔ	-	s	i	-	-	k	o	-	ɲ	ɔ	s	-	i	-	-	k	o	-	ɲ	ɔ	s	-	i	-	-
Italian	k	o	-	n	o	ʃ	ʃ	e	r	e	k	o	-	n	o	ʃ	ʃ	e	r	e	k	o	-	n	o	ʃ	ʃ	e	r	e

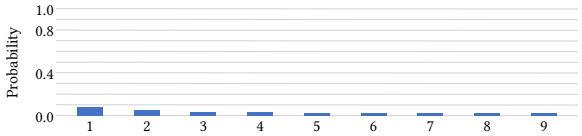
	0.0236 (0.101)										0.0216 (0.123)										0.0199 (0.143)									
Latin	k	o	g	n	oː	s	k	e	r	e	k	o	g	n	oː	s	k	e	r	e	k	o	g	n	oː	s	k	e	r	e
Romanian	k	u	-	n	o̯a	ʃ	t	e	-	-	k	u	-	n	o̯a	ʃ	t	-	-	e	k	u	-	n	o̯a	ʃ	t	e	-	-
Portuguese	k	u	-	ɲ	ɨ	-	s	e	ɾ	-	k	u	-	ɲ	ɨ	s	-	e	ɾ	-	k	u	-	ɲ	ɨ	s	-	e	ɾ	-
Spanish	k	o	-	n	o	-	θ	e	ɾ	-	k	o	-	n	o	θ	-	e	ɾ	-	k	o	-	n	o	θ	-	e	ɾ	-
Catalan	k	u	-	n	ɛ	-	ʃ	ə	-	-	k	u	-	n	ɛ	ʃ	-	ə	-	-	k	u	-	n	ɛ	ʃ	-	ə	-	-
French	k	ɔ	-	n	ɛ	-	t	-	ʁ	-	k	ɔ	-	n	ɛ	t	-	-	ʁ	-	k	ɔ	-	n	ɛ	t	-	ʁ	-	-
Walloon	k	i	-	n	ɔ	-	h	-	-	-	k	i	-	n	ɔ	h	-	-	-	-	k	i	-	n	ɔ	h	-	-	-	-
Friulian	k	o	-	ɲ	ɔ	-	s	i	-	-	k	o	-	ɲ	ɔ	s	-	i	-	-	k	o	-	ɲ	ɔ	s	-	i	-	-
Italian	k	o	-	n	o	ʃ	ʃ	e	r	e	k	o	-	n	o	ʃ	ʃ	e	r	e	k	o	-	n	o	ʃ	ʃ	e	r	e

0.0158 (0.159)									
k	o	g	n	oː	s	k	e	ɾ	e
k	u	-	n	ɑ̯a	ʃ	t	-	-	e
k	u	-	ɲ	ɨ	s	-	e	ɾ	-
k	o	-	n	o	θ	-	e	ɾ	-
k	u	-	n	ɛ	ʃ	-	-	ə	-
k	ɔ	-	n	ɛ	t	-	-	ʁ	-
k	i	-	n	ɔ	h	-	-	-	-
k	o	-	ɲ	ɔ	s	-	i	-	-
k	o	-	n	o	ʃ	ʃ	e	ɾ	e

0.0153 (0.174)									
k	o	g	n	oː	s	k	e	ɾ	e
k	u	-	n	ɑ̯a	ʃ	t	e	-	-
k	u	-	ɲ	ɨ	-	s	e	ɾ	-
k	o	-	n	o	-	θ	e	ɾ	-
k	u	-	n	ɛ	-	ʃ	ə	-	-
k	ɔ	-	n	ɛ	-	t	ʁ	-	-
k	i	-	n	ɔ	-	h	-	-	-
k	o	-	ɲ	ɔ	-	s	i	-	-
k	o	-	n	o	ʃ	ʃ	e	ɾ	e

0.0152 (0.189)									
k	o	g	n	oː	s	k	e	ɾ	e
k	u	-	n	ɑ̯a	ʃ	t	-	-	e
k	u	-	ɲ	ɨ	-	s	e	ɾ	-
k	o	-	n	o	-	θ	e	ɾ	-
k	u	-	n	ɛ	-	ʃ	ə	-	-
k	ɔ	-	n	ɛ	-	t	ʁ	-	-
k	i	-	n	ɔ	-	h	-	-	-
k	o	-	ɲ	ɔ	-	s	i	-	-
k	o	-	n	o	ʃ	ʃ	e	ɾ	e

ToLaugh



	0.0811					
Latin	r	iː	d	eː	r	e
Romanian	r	ɨ	d	-	-	e
Portuguese	ʁ	-	-	i	ɾ	-
Spanish	r	e	-	i	ɾ	-
Catalan	r	i	-	w	ɾ	ə
French	ʁ	i	-	-	ʁ	-
Walloon	r	i	-	-	r	-
Friulian	r	i	d	i	-	-
Italian	r	i	d	e	r	e

	0.0549 (0.136)					
Latin	r	iː	d	eː	r	e
Romanian	r	ɨ	d	e	-	-
Portuguese	ʁ	-	-	i	ɾ	-
Spanish	r	e	-	i	ɾ	-
Catalan	r	i	-	w	ɾ	ə
French	ʁ	i	-	-	ʁ	-
Walloon	r	i	-	-	r	-
Friulian	r	i	d	i	-	-
Italian	r	i	d	e	r	e

	0.0353 (0.171)					
Latin	r	iː	d	eː	r	e
Romanian	r	ɨ	d	-	-	e
Portuguese	ʁ	i	-	-	ɾ	-
Spanish	r	e	-	i	ɾ	-
Catalan	r	i	-	w	ɾ	ə
French	ʁ	i	-	-	ʁ	-
Walloon	r	i	-	-	r	-
Friulian	r	i	d	i	-	-
Italian	r	i	d	e	r	e

	0.0329 (0.204)						
Latin	r	iː	d	eː	r	e	-
Romanian	r	ɨ	d	-	-	e	-
Portuguese	ʁ	-	-	i	ɾ	-	-
Spanish	r	e	-	i	ɾ	-	-
Catalan	r	i	-	w	ɾ	-	ə
French	ʁ	i	-	-	ʁ	-	-
Walloon	r	i	-	-	r	-	-
Friulian	r	i	d	i	-	-	-
Italian	r	i	d	e	r	e	-

	0.0253 (0.229)						
Latin	r	-	iː	d	eː	r	e
Romanian	r	-	ɨ	d	e	-	-
Portuguese	ʁ	-	i	-	-	ɾ	-
Spanish	r	e	i	-	-	ɾ	-
Catalan	r	-	i	w	-	ɾ	ə
French	ʁ	-	i	-	-	ʁ	-
Walloon	r	-	i	-	-	r	-
Friulian	r	-	i	d	-	-	i
Italian	r	-	i	d	e	r	e

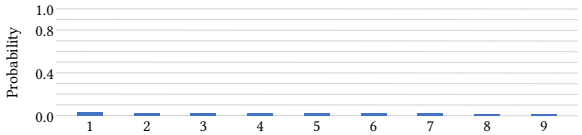
	0.0252 (0.255)						
Latin	r	iː	d	eː	r	-	e
Romanian	r	ɨ	d	e	-	-	-
Portuguese	ʁ	-	-	i	ɾ	-	-
Spanish	r	e	-	i	ɾ	-	-
Catalan	r	i	-	w	ɾ	ə	-
French	ʁ	i	-	-	ʁ	-	-
Walloon	r	i	-	-	r	-	-
Friulian	r	i	d	i	-	-	-
Italian	r	i	d	e	r	-	e

	0.0223 (0.277)						
Latin	r	-	iː	d	eː	r	e
Romanian	r	-	ɨ	d	-	-	e
Portuguese	ʁ	-	i	-	-	ɾ	-
Spanish	r	e	i	-	-	ɾ	-
Catalan	r	-	i	w	-	ɾ	ə
French	ʁ	-	i	-	-	ʁ	-
Walloon	r	-	i	-	-	r	-
Friulian	r	-	i	d	-	-	i
Italian	r	-	i	d	e	r	e

	0.0201 (0.297)						
Latin	r	iː	d	eː	r	e	
Romanian	r	ɨ	d	e	-	-	-
Portuguese	ʁ	i	-	-	ɾ	-	-
Spanish	r	e	-	i	ɾ	-	-
Catalan	r	i	-	w	ɾ	ə	
French	ʁ	i	-	-	ʁ	-	-
Walloon	r	i	-	-	r	-	-
Friulian	r	i	d	i	-	-	-
Italian	r	i	d	e	r	e	

	0.0194 (0.317)						
Latin	r	iː	d	eː	r	e	
Romanian	r	ɨ	d	-	-	e	
Portuguese	ʁ	-	-	i	ɾ	-	-
Spanish	r	e	-	i	ɾ	-	-
Catalan	r	i	-	w	ɾ	ə	
French	ʁ	i	-	-	ʁ	-	-
Walloon	r	i	-	-	r	-	-
Friulian	r	i	d	-	-	i	
Italian	r	i	d	e	r	e	

ToLieAsInABed



	0.0352					
Latin	j	a	k	eː	r	e
Romanian	z	ə	ʧ	-	-	e̯a
Portuguese	ʒ	ɐ	z	e	ɾ	-
Spanish	ʝ	a	θ	e	ɾ	-
Catalan	ʒ	a	w	-	ɾ	ə
French	ʒ	e	z	i	ʁ	-
Walloon	-	-	ʤ	i	r	-
Friulian	j	e	s	-	-	i
Italian	ʤ	a	ʧ	e	r	e

	0.0257 (0.0609)					
Latin	j	a	k	eː	r	e
Romanian	z	ə	ʧ	-	-	e̯a
Portuguese	ʒ	ɐ	z	e	ɾ	-
Spanish	ʝ	a	θ	e	ɾ	-
Catalan	ʒ	a	w	-	ɾ	ə
French	ʒ	e	z	i	ʁ	-
Walloon	-	-	ʤ	i	r	-
Friulian	j	e	s	i	-	-
Italian	ʤ	a	ʧ	e	r	e

	0.0246 (0.0855)					
Latin	j	a	k	-	eː	r	e
Romanian	z	ə	ʧ	-	-	-	e̯a
Portuguese	ʒ	ɐ	z	-	e	ɾ	-
Spanish	ʝ	a	θ	-	e	ɾ	-
Catalan	ʒ	a	w	ɾ	ə	-	-
French	ʒ	e	z	-	i	ʁ	-
Walloon	-	-	ʤ	-	i	r	-
Friulian	j	e	s	-	i	-	-
Italian	ʤ	a	ʧ	-	e	r	e

	0.0224 (0.108)						
Latin	j	a	k	eː	r	e	
Romanian	z	ə	ʧ	e̯a	-	-	
Portuguese	ʒ	ɐ	z	e	ɾ	-	
Spanish	ʝ	a	θ	e	ɾ	-	
Catalan	ʒ	a	w	-	ɾ	ə	
French	ʒ	e	z	i	ʁ	-	
Walloon	-	-	ʤ	i	r	-	
Friulian	j	e	s	-	-	i	
Italian	ʤ	a	ʧ	e	r	e	

	0.0219 (0.130)					
Latin	j	a	k	eː	r	e
Romanian	z	ə	ʧ	e̯a	-	-
Portuguese	ʒ	ɐ	z	e	ɾ	-
Spanish	ʝ	a	θ	e	ɾ	-
Catalan	ʒ	a	w	-	ɾ	ə
French	ʒ	e	z	i	ʁ	-
Walloon	ʤ	-	-	i	r	-
Friulian	j	e	s	-	-	i
Italian	ʤ	a	ʧ	e	r	e

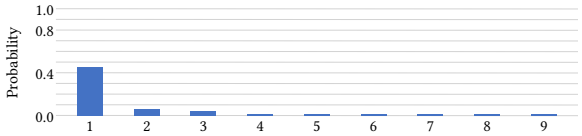
0.0214 (0.151)					
j	a	k	eː	r	e
z	ə	ʧ	ea	–	–
ʒ	ɐ	z	e	ɾ	–
j	a	θ	e	ɾ	–
ʒ	a	w	–	ɾ	ə
ʒ	e	z	i	ʁ	–
ʤ	–	–	i	r	–
j	e	s	i	–	–
ʤ	a	ʧ	e	r	e

0.0194 (0.171)					
j	a	k	eː	r	e
z	ə	ʧ	ea	–	–
ʒ	ɐ	z	e	ɾ	–
j	a	θ	e	ɾ	–
ʒ	a	w	–	ɾ	ə
ʒ	e	z	i	ʁ	–
–	–	ʤ	i	r	–
j	e	s	i	–	–
ʤ	a	ʧ	e	r	e

0.0159 (0.186)					
j	a	k	eː	r	e
z	ə	ʧ	–	–	ea
ʒ	ɐ	z	e	ɾ	–
j	a	θ	e	ɾ	–
ʒ	a	w	–	ɾ	ə
ʒ	e	z	i	ʁ	–
ʤ	–	–	i	r	–
j	e	s	–	–	i
ʤ	a	ʧ	e	r	e

0.0146 (0.201)					
j	a	k	eː	r	e
z	ə	ʧ	ea	–	–
ʒ	ɐ	z	e	ɾ	–
j	a	θ	e	ɾ	–
ʒ	a	–	w	ɾ	ə
ʒ	e	z	i	ʁ	–
–	–	ʤ	i	r	–
j	e	s	–	–	i
ʤ	a	ʧ	e	r	e

ToPlay



	0.459					
Latin	j	o	k	aː	r	e
Romanian	ʒ	u	k	a	–	–
Portuguese	ʒ	u	g	a	ɾ	–
Spanish	x	u	g	a	ɾ	–
Catalan	ʒ	u	g	a	–	–
French	ʒ	–	w	e	–	–
Walloon	ʤ	u	w	e	–	–
Friulian	ʤ	u	j	aː	–	–
Italian	ʤ	o	k	a	r	e

	0.0638 (0.523)					
Latin	j	o	k	aː	r	e
Romanian	ʒ	u	k	–	–	a
Portuguese	ʒ	u	g	a	ɾ	–
Spanish	x	u	g	a	ɾ	–
Catalan	ʒ	u	g	a	–	–
French	ʒ	–	w	e	–	–
Walloon	ʤ	u	w	e	–	–
Friulian	ʤ	u	j	aː	–	–
Italian	ʤ	o	k	a	r	e

	0.0395 (0.562)					
Latin	j	o	k	aː	r	e
Romanian	ʒ	u	k	a	–	–
Portuguese	ʒ	u	g	a	ɾ	–
Spanish	x	u	g	a	ɾ	–
Catalan	ʒ	u	g	a	–	–
French	ʒ	–	w	e	–	–
Walloon	ʤ	u	w	e	–	–
Friulian	ʤ	u	–	j	aː	–
Italian	ʤ	o	k	a	r	e

	0.0172 (0.579)					
Latin	j	o	k	aː	r	e
Romanian	ʒ	u	k	a	–	–
Portuguese	ʒ	u	g	a	ɾ	–
Spanish	x	u	g	a	ɾ	–
Catalan	ʒ	u	g	a	–	–
French	ʒ	–	w	e	–	–
Walloon	ʤ	u	w	e	–	–
Friulian	ʤ	u	j	–	aː	–
Italian	ʤ	o	k	a	r	e

	0.0157 (0.595)					
Latin	j	o	k	aː	r	e
Romanian	ʒ	u	k	a	–	–
Portuguese	ʒ	u	g	a	–	ɾ
Spanish	x	u	g	a	–	ɾ
Catalan	ʒ	u	g	a	–	–
French	ʒ	–	w	e	–	–
Walloon	ʤ	u	w	e	–	–
Friulian	ʤ	u	j	aː	–	–
Italian	ʤ	o	k	a	r	e

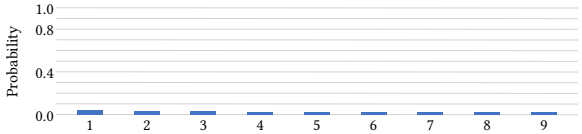
0.0145 (0.610)					
j	o	k	aː	r	e
ʒ	u	k	a	–	–
ʒ	u	g	a	ɾ	–
x	u	g	a	ɾ	–
ʒ	u	g	a	–	–
ʒ	–	w	e	–	–
ʤ	u	w	e	–	–
ʤ	u	–	–	j	aː
ʤ	o	k	a	r	e

0.0127 (0.622)					
j	o	k	–	aː	r	e
ʒ	u	k	–	a	–	–
ʒ	u	–	g	a	ɾ	–
x	u	–	g	a	ɾ	–
ʒ	u	–	g	a	–	–
ʒ	–	–	w	e	–	–
ʤ	u	–	w	e	–	–
ʤ	u	–	j	aː	–	–
ʤ	o	k	–	a	r	e

0.0121 (0.635)					
j	o	k	aː	r	e
ʒ	u	k	a	–	–
ʒ	u	g	a	ɾ	–
x	u	g	a	ɾ	–
ʒ	u	g	a	–	–
ʒ	w	–	e	–	–
ʤ	u	w	e	–	–
ʤ	u	j	aː	–	–
ʤ	o	k	a	r	e

0.0116 (0.646)					
j	o	–	k	aː	r	e
ʒ	u	–	k	a	–	–
ʒ	u	g	–	a	ɾ	–
x	u	g	–	a	ɾ	–
ʒ	u	g	–	a	–	–
ʒ	–	w	–	e	–	–
ʤ	u	w	–	e	–	–
ʤ	u	–	j	–	aː	–
ʤ	o	–	k	a	r	e

ToSay



	0.0393						
Latin	d	iː	k	e	r	e	–
Romanian	z	i	–	–	ʧ	e	–
Portuguese	d	i	–	–	z	e	ɾ
Spanish	d	e	–	–	θ	i	ɾ
Catalan	d	i	–	–	–	–	–
French	d	i	–	–	–	–	ʁ
Walloon	d	i	–	–	–	–	r
Friulian	d	–	–	–	–	iː	–
Italian	d	i	–	–	r	e	–

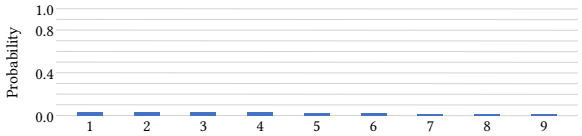
	0.0368 (0.0761)					
Latin	d	iː	k	e	r	e
Romanian	z	i	ʧ	e	–	–
Portuguese	d	i	z	e	ɾ	–
Spanish	d	e	θ	i	ɾ	–
Catalan	d	i	–	–	–	–
French	d	i	–	–	ʁ	–
Walloon	d	i	–	–	r	–
Friulian	d	–	–	iː	–	–
Italian	d	i	r	e	–	–

	0.0328 (0.109)					
Latin	d	iː	k	e	r	e
Romanian	z	i	ʧ	e	–	–
Portuguese	d	i	z	e	ɾ	–
Spanish	d	e	θ	i	ɾ	–
Catalan	d	i	–	–	–	–
French	d	i	–	–	ʁ	–
Walloon	d	i	–	–	r	–
Friulian	d	iː	–	–	–	–
Italian	d	i	r	e	–	–

	0.0264 (0.135)						
Latin	d	iː	k	e	r	e	–
Romanian	z	–	–	i	ʧ	e	–
Portuguese	d	–	–	i	z	e	ɾ
Spanish	d	–	–	e	θ	i	ɾ
Catalan	d	–	–	i	–	–	–
French	d	–	–	i	–	–	ʁ
Walloon	d	–	–	i	–	–	r
Friulian	d	–	–	–	–	iː	–
Italian	d	–	–	i	r	e	–

0.0239 (0.159)	0.0227 (0.182)	0.0221 (0.204)	0.0217 (0.226)	0.0197 (0.245)
d iː k e r e -	d iː k e r e -	d iː k e r e -	d iː k e r e -	d iː k e r e -
z i ʧ e - - -	z i - - ʧ e -	z i - - ʧ e -	z i - - ʧ e -	z i - - ʧ e -
d i z e - - ɾ	d i - - z e ɾ	d i - - z e ɾ	d i - - z e ɾ	d i - - z e ɾ
d e θ i - - ɾ	d e - - θ i ɾ	d e - - θ i ɾ	d e - - θ i ɾ	d e - - θ i ɾ
d i - - - - -	d i - - - - -	d i - - - - -	d i - - - - -	d - - - - i -
d i - - - - ʁ	d i - - - - ʁ	d i - - ʁ - -	d i - - ʁ - -	d - - - - i ʁ
d i - - - - r	d i - - - - r	d i - - r - -	d i - - r - -	d - - - - i r
d - - iː - - -	d iː - - - - -	d iː - - - - -	d - - - - iː -	d iː - - - - -
d i r e - - -	d i - - r e -	d i - - r e -	d i - - r e -	d i - - r e -

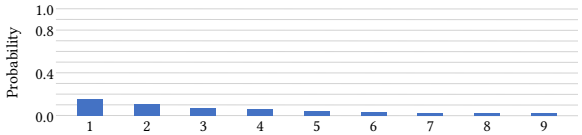
ToSee



	0.0373	0.0339 (0.0712)	0.0295 (0.101)	0.0292 (0.130)	0.0254 (0.155)
Latin	w i d eː r e	w i d eː r e	w i d eː r e	w - i d eː r e -	w i d eː r e
Romanian	v e d - - ɡa	v e d - - ɡa	v e d ɡa - -	v - e d - - ɡa -	v e d - - ɡa
Portuguese	v e - - ɾ -	v - - e ɾ -	v e - - ɾ -	v - e - - ɾ - -	v e - - ɾ -
Spanish	b e - - ɾ -	b - - e ɾ -	b e - - ɾ -	b - e - - ɾ - -	b e - - ɾ -
Catalan	b ɛ - w ɾ ə	b ɛ - w ɾ ə	b ɛ - w ɾ ə	b - ɛ w - ɾ ə -	b ɛ - w ɾ ə
French	v w - a ʁ -	v w - a ʁ -	v w - a ʁ -	v - - w - - a ʁ	v w - a ʁ -
Walloon	v - - ɛj - -	v - - ɛj - -	v - - ɛj - -	v - - - - - ɛj -	v ɛj - - - -
Friulian	v j - o d i	v j - o d i	v j - o d i	v j o d - - i -	v j - o d i
Italian	v e d e r e	v e d e r e	v e d e r e	v - e d e r e -	v e d e r e

0.0223 (0.178)	0.0157 (0.193)	0.0146 (0.208)	0.0144 (0.222)
w i d eː r e	w i d eː r e	w i d eː r - e	w i d eː r e
v e d ɡa - -	v e d - - ɡa	v e d - - - ɡa	v e d ɡa - -
v - - e ɾ -	v - - e ɾ -	v - - e ɾ - -	v e - - ɾ -
b - - e ɾ -	b - - e ɾ -	b - - e ɾ - -	b e - - ɾ -
b ɛ - w ɾ ə	b ɛ - w ɾ ə	b ɛ - w ɾ - ə	b ɛ - w ɾ ə
v w - a ʁ -	v w - a ʁ -	v w - a ʁ - -	v w - a ʁ -
v - - ɛj - -	v ɛj - - - -	v - - ɛj - - -	v ɛj - - - -
v j - o d i	v j - o d i	v j - o - d i	v j - o d i
v e d e r e	v e d e r e	v e d e r - e	v e d e r e

ToSew



	0.151	0.105 (0.256)	0.0728 (0.329)	0.0564 (0.385)
Latin	k oː n s u e r e	k oː n s u e r e	k oː n s u e r e	k oː n s u e r e
Romanian	k o̯a - s - - - e	k o̯a - s - - - e	k o̯a - s - - - e	k o̯a - s - - - e
Portuguese	k u - z - e ɾ -	k u - z e - ɾ -	k u - z - e ɾ -	k u - z e - ɾ -
Spanish	k o - s - e ɾ -	k o - s e - ɾ -	k o - s - e ɾ -	k o - s e - ɾ -
Catalan	k u - z - i - -	k u - z i - - -	k u - z - i - -	k u - z i - - -
French	k u - d - - ʁ -	k u - d - - ʁ -	k u - d - ʁ - -	k u - d ʁ - - -
Walloon	k ø - z - - - -	k ø - z - - - -	k ø - z - - - -	k ø - z - - - -
Friulian	k u - z - i - -	k u - z i - - -	k u - z - i - -	k u - z i - - -
Italian	k u - ʧ - i r e	k u - ʧ i - r e	k u - ʧ - i r e	k u - ʧ i - r e

0.0394 (0.425)							
k	oː	n	s	u	e	r	e
k	ɑ̯a	-	s	-	e	-	-
k	u	-	z	-	e	ɾ	-
k	o	-	s	-	e	ɾ	-
k	u	-	z	-	i	-	-
k	u	-	d	-	-	ʁ	-
k	ø	-	z	-	-	-	-
k	u	-	z	-	i	-	-
k	u	-	ʧ	-	i	r	e

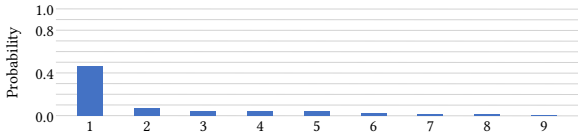
0.0288 (0.453)							
k	oː	n	s	-	u	e	r	e
k	ɑ̯a	-	s	-	-	-	-	e
k	u	-	z	-	-	e	ɾ	-
k	o	-	s	-	-	e	ɾ	-
k	u	-	z	-	-	i	-	-
k	u	-	d	ʁ	-	-	-	-
k	ø	-	z	-	-	-	-	-
k	u	-	z	-	-	i	-	-
k	u	-	ʧ	-	-	i	r	e

0.0252 (0.479)							
k	oː	n	s	u	e	r	e
k	ɑ̯a	-	s	-	e	-	-
k	u	-	z	-	e	ɾ	-
k	o	-	s	-	e	ɾ	-
k	u	-	z	-	i	-	-
k	u	-	d	-	ʁ	-	-
k	ø	-	z	-	-	-	-
k	u	-	z	-	i	-	-
k	u	-	ʧ	-	i	r	e

0.0217 (0.500)							
k	oː	n	s	u	e	r	e
k	ɑ̯a	-	s	-	-	-	e
k	u	-	z	-	e	ɾ	-
k	o	-	s	-	e	ɾ	-
k	u	-	z	-	-	i	-
k	u	-	d	-	-	ʁ	-
k	ø	-	z	-	-	-	-
k	u	-	z	-	i	-	-
k	u	-	ʧ	-	i	r	e

0.0191 (0.519)							
k	oː	n	s	u	-	e	r	e
k	ɑ̯a	-	s	-	-	-	-	e
k	u	-	z	-	-	e	ɾ	-
k	o	-	s	-	-	e	ɾ	-
k	u	-	z	-	-	i	-	-
k	u	-	d	-	ʁ	-	-	-
k	ø	-	z	-	-	-	-	-
k	u	-	z	-	-	i	-	-
k	u	-	ʧ	-	-	i	r	e

ToSing



	0.464						
Latin	k	a	n	t	aː	r	e
Romanian	k	ɨ	n	t	a	-	-
Portuguese	k	-	ɐ̃	t	a	ɾ	-
Spanish	k	a	n	t	a	ɾ	-
Catalan	k	ə	n	t	a	-	-
French	ʃ	-	ɑ̃	t	e	-	-
Walloon	ʧ	-	ɑ̃	t	e	-	-
Friulian	c	a	n	t	aː	-	-
Italian	k	a	n	t	a	r	e

	0.0719 (0.536)						
Latin	k	a	n	t	aː	r	e
Romanian	k	ɨ	n	t	-	-	a
Portuguese	k	-	ɐ̃	t	a	ɾ	-
Spanish	k	a	n	t	a	ɾ	-
Catalan	k	ə	n	t	a	-	-
French	ʃ	-	ɑ̃	t	e	-	-
Walloon	ʧ	-	ɑ̃	t	e	-	-
Friulian	c	a	n	t	aː	-	-
Italian	k	a	n	t	a	r	e

	0.0457 (0.581)						
Latin	k	a	n	t	aː	r	e
Romanian	k	ɨ	n	t	a	-	-
Portuguese	k	ɐ̃	-	t	a	ɾ	-
Spanish	k	a	n	t	a	ɾ	-
Catalan	k	ə	n	t	a	-	-
French	ʃ	-	ɑ̃	t	e	-	-
Walloon	ʧ	-	ɑ̃	t	e	-	-
Friulian	c	a	n	t	aː	-	-
Italian	k	a	n	t	a	r	e

	0.0399 (0.621)						
Latin	k	a	n	t	aː	r	e
Romanian	k	ɨ	n	t	a	-	-
Portuguese	k	-	ɐ̃	t	a	ɾ	-
Spanish	k	a	n	t	a	ɾ	-
Catalan	k	ə	n	t	a	-	-
French	ʃ	ɑ̃	-	t	e	-	-
Walloon	ʧ	ɑ̃	-	t	e	-	-
Friulian	c	a	n	t	aː	-	-
Italian	k	a	n	t	a	r	e

0.0394 (0.661)						
k	a	n	t	aː	r	e
k	ɨ	n	t	a	-	-
k	-	ɐ̃	t	a	ɾ	-
k	a	n	t	a	ɾ	-
k	ə	n	t	a	-	-
-	ʃ	ɑ̃	t	e	-	-
-	ʧ	ɑ̃	t	e	-	-
c	a	n	t	aː	-	-
k	a	n	t	a	r	e

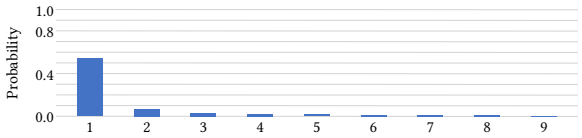
0.0204 (0.681)						
k	a	n	t	aː	r	e
k	ɨ	n	t	a	-	-
k	-	ɐ̃	t	a	ɾ	-
k	a	n	t	a	ɾ	-
k	ə	n	t	a	-	-
ʃ	-	ɑ̃	t	e	-	-
ʧ	-	ɑ̃	t	e	-	-
c	a	n	t	-	aː	-
k	a	n	t	a	r	e

0.0152 (0.696)							
k	a	n	t	aː	r	e	-
k	ɨ	n	t	a	-	-	-
k	-	ɐ̃	t	a	-	-	ɾ
k	a	n	t	a	-	-	ɾ
k	ə	n	t	a	-	-	-
ʃ	-	ɑ̃	t	e	-	-	-
ʧ	-	ɑ̃	t	e	-	-	-
c	a	n	t	aː	-	-	-
k	a	n	t	a	r	e	-

0.0108 (0.707)							
k	a	n	t	aː	r	-	e
k	ɨ	n	t	a	-	-	-
k	-	ɐ̃	t	a	-	ɾ	-
k	a	n	t	a	-	ɾ	-
k	ə	n	t	a	-	-	-
ʃ	-	ɑ̃	t	e	-	-	-
ʧ	-	ɑ̃	t	e	-	-	-
c	a	n	t	aː	-	-	-
k	a	n	t	a	r	-	e

0.00854 (0.715)							
k	a	n	t	-	aː	r	e
k	ɨ	n	t	a	-	-	-
k	-	ɐ̃	t	a	-	ɾ	-
k	a	n	t	a	-	ɾ	-
k	ə	n	t	a	-	-	-
ʃ	-	ɑ̃	t	e	-	-	-
ʧ	-	ɑ̃	t	e	-	-	-
c	a	n	t	aː	-	-	-
k	a	n	t	a	-	r	e

ToSleep

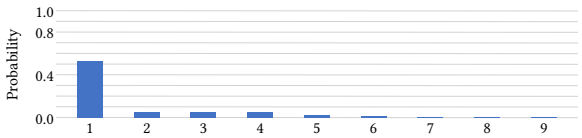


	0.543	0.0676 (0.611)	0.0283 (0.639)	0.0224 (0.661)
Latin	d - o r m iː r e	d - o r m iː r e	d o - r m iː r e	d - o r m iː r e
Romanian	d - o r m i - -	d - o r m - - i	d o - r m i - -	d - o r m i - -
Portuguese	d - u ɾ m i ɾ -	d - u ɾ m i ɾ -	d u - ɾ m i ɾ -	d - u ɾ m i ɾ -
Spanish	d - o ɾ m i ɾ -	d - o ɾ m i ɾ -	d o - ɾ m i ɾ -	d - o ɾ m i ɾ -
Catalan	d - u ɾ m i - -	d - u ɾ m i - -	d u - ɾ m i - -	d - u ɾ m i - -
French	d - ɔ ʁ m i ʁ -	d - ɔ ʁ m i ʁ -	d ɔ - ʁ m i ʁ -	d - ɔ ʁ m i ʁ -
Walloon	d w ɛ ʁ m i - -	d w ɛ ʁ m i - -	d w ɛ ʁ m i - -	d w ɛ ʁ m i - -
Friulian	d - u r m iː - -	d - u r m iː - -	d u - r m iː - -	d - u r m - iː -
Italian	d - o r m i r e	d - o r m i r e	d o - r m i r e	d - o r m i r e

	0.0185 (0.680)	0.0117 (0.692)	0.0116 (0.703)	0.00969 (0.713)
Latin	d - o r m iː r e	d - o r m iː r e -	d o - r m iː r e	d - o r m iː r e -
Romanian	d - o r m i - -	d - o r m i - - -	d o - r m i - -	d - o r m i - - -
Portuguese	d - u ɾ m i ɾ -	d - u ɾ m i ɾ - -	d u - ɾ m i ɾ -	d - u ɾ m i - - ɾ
Spanish	d - o ɾ m i ɾ -	d - o ɾ m i ɾ - -	d o - ɾ m i ɾ -	d - o ɾ m i - - ɾ
Catalan	d - u ɾ m i - -	d - u ɾ m i - - -	d u - ɾ m i - -	d - u ɾ m i - - -
French	d ɔ - ʁ m i ʁ -	d - ɔ ʁ m i ʁ - -	d - ɔ ʁ m i ʁ -	d - ɔ ʁ m i - - ʁ
Walloon	d w ɛ ʁ m i - -	d w ɛ ʁ m i - - -	d w ɛ ʁ m i - -	d w ɛ ʁ m i - - -
Friulian	d - u r m iː - -	d - u r m iː - - -	d u - r m iː - -	d - u r m iː - - -
Italian	d - o r m i r e	d - o r m i r - e	d o - r m i r e	d - o r m i r e -

	0.00843 (0.721)
Latin	d - o r m iː r - e
Romanian	d - o r m i - - -
Portuguese	d - u ɾ m i ɾ - -
Spanish	d - o ɾ m i ɾ - -
Catalan	d - u ɾ m i - - -
French	d - ɔ ʁ m i ʁ - -
Walloon	d w ɛ ʁ m i - - -
Friulian	d - u r m iː - - -
Italian	d - o r m i r e -

ToSmell



	0.528	0.0522 (0.581)	0.0511 (0.632)	0.0507 (0.682)
Latin	s e n t iː r e	s e n t iː r e	s e n t iː r e	s e n t iː r e
Romanian	s i m ts i - -	s i m ts - - i	s i m ts i - -	s i m ts i - -
Portuguese	s - ẽ t i ɾ -	s - ẽ t i ɾ -	s - ẽ t i ɾ -	s ẽ - t i ɾ -
Spanish	s e n t i ɾ -	s e n t i ɾ -	s e n t i ɾ -	s e n t i ɾ -
Catalan	s ə n t i - -	s ə n t i - -	s ə n t i - -	s ə n t i - -
French	s - ɑ̃ t i ʁ -	s - ɑ̃ t i ʁ -	s ɑ̃ - t i ʁ -	s - ɑ̃ t i ʁ -
Walloon	s - ɛ̃ t i - -	s - ɛ̃ t i - -	s ɛ̃ - t i - -	s - ɛ̃ t i - -
Friulian	s i n t iː - -	s i n t iː - -	s i n t iː - -	s i n t iː - -
Italian	s e n t i r e	s e n t i r e	s e n t i r e	s e n t i r e

0.0262 (0.709)						
s	e	n	t	iː	r	e
s	i	m	ts	i	-	-
s	-	ẽ	t	i	ɾ	-
s	e	n	t	i	ɾ	-
s	ə	n	t	i	-	-
s	-	ɑ̃	t	i	ʁ	-
s	-	ɛ̃	t	i	-	-
s	i	n	t	-	iː	-
s	e	n	t	i	r	e

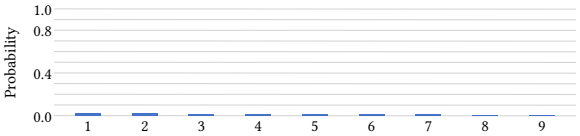
0.0130 (0.722)							
s	e	n	t	iː	r	e	-
s	i	m	ts	i	-	-	-
s	-	ẽ	t	i	ɾ	-	-
s	e	n	t	i	ɾ	-	-
s	ə	n	t	i	-	-	-
s	-	ɑ̃	t	i	ʁ	-	-
s	-	ɛ̃	t	i	-	-	-
s	i	n	t	iː	-	-	-
s	e	n	t	i	r	-	e

0.00851 (0.730)						
s	e	n	t	iː	-	r	e
s	i	m	ts	-	i	-	-
s	-	ẽ	t	-	i	ɾ	-
s	e	n	t	-	i	ɾ	-
s	ə	n	t	-	i	-	-
s	-	ɑ̃	t	-	i	ʁ	-
s	-	ɛ̃	t	-	i	-	-
s	i	n	t	-	iː	-	-
s	e	n	t	-	i	r	e

0.00843 (0.739)							
s	e	n	t	-	iː	r	e
s	i	m	-	ts	i	-	-
s	-	ẽ	t	-	i	ɾ	-
s	e	n	t	-	i	ɾ	-
s	ə	n	t	-	i	-	-
s	-	ɑ̃	t	-	i	ʁ	-
s	-	ɛ̃	t	-	i	-	-
s	i	n	t	-	iː	-	-
s	e	n	t	-	i	r	e

0.00734 (0.746)							
s	-	e	n	t	iː	r	e
s	i	-	m	ts	i	-	-
s	-	-	ẽ	t	i	ɾ	-
s	e	-	n	t	i	ɾ	-
s	ə	-	n	t	i	-	-
s	-	-	ɑ̃	t	i	ʁ	-
s	-	-	ɛ̃	t	i	-	-
s	i	-	n	t	iː	-	-
s	e	-	n	t	i	r	e

ToSqueeze



	0.0233									
Latin	-	s	t	r	i	n	g	e	r	e
Romanian	-	s	t	r	ɨ	n	ʤ	-	-	e
Portuguese	ɨ	ʃ	t	r	-	ĩ	ʒ	i	ɾ	-
Spanish	e	s	t	ɾ	e	ɲ	-	i	ɾ	-
Catalan	ə	s	t	ɾ	ɛ	ɲ	-	ə	-	-
French	-	e	t	ʁ	ɛ̃	-	-	d	ʁ	-
Walloon	-	s	t	r	ɛ̃	n	-	d	-	-
Friulian	-	s	t	r	ɛ	n	ʤ	iː	-	-
Italian	-	s	t	r	i	n	ʤ	e	r	e

0.0188 (0.0420)										
-	s	t	r	i	n	g	e	r	e	
-	s	t	r	ɨ	n	ʤ	-	-	e	
ɨ	ʃ	t	r	-	ĩ	ʒ	i	ɾ	-	
e	s	t	ɾ	e	ɲ	-	i	ɾ	-	
ə	s	t	ɾ	ɛ	ɲ	ə	-	-	-	
-	e	t	ʁ	ɛ̃	-	d	-	ʁ	-	
-	s	t	r	ɛ̃	n	d	-	-	-	
-	s	t	r	ɛ	n	ʤ	iː	-	-	
-	s	t	r	i	n	ʤ	e	r	e	

0.0151 (0.0571)										
-	s	t	r	i	n	g	e	r	e	
-	s	t	r	ɨ	n	ʤ	-	-	e	
ɨ	ʃ	t	r	-	ĩ	ʒ	i	ɾ	-	
e	s	t	ɾ	e	ɲ	-	i	ɾ	-	
ə	s	t	ɾ	ɛ	ɲ	-	ə	-	-	
-	e	t	ʁ	ɛ̃	-	d	-	ʁ	-	
-	s	t	r	ɛ̃	n	d	-	-	-	
-	s	t	r	ɛ	n	ʤ	iː	-	-	
-	s	t	r	i	n	ʤ	e	r	e	

0.0144 (0.0715)										
-	s	t	r	i	n	g	e	r	e	
-	s	t	r	ɨ	n	ʤ	-	-	e	
ɨ	ʃ	t	r	ĩ	ʒ	-	i	ɾ	-	
e	s	t	ɾ	e	ɲ	-	i	ɾ	-	
ə	s	t	ɾ	ɛ	ɲ	-	ə	-	-	
-	e	t	ʁ	ɛ̃	-	-	d	ʁ	-	
-	s	t	r	ɛ̃	n	-	d	-	-	
-	s	t	r	ɛ	n	ʤ	iː	-	-	
-	s	t	r	i	n	ʤ	e	r	e	

0.0143 (0.0857)										
-	s	t	r	i	n	g	e	r	e	
-	s	t	r	ɨ	n	ʤ	e	-	-	
ɨ	ʃ	t	r	-	ĩ	ʒ	i	ɾ	-	
e	s	t	ɾ	e	ɲ	-	i	ɾ	-	
ə	s	t	ɾ	ɛ	ɲ	-	ə	-	-	
-	e	t	ʁ	ɛ̃	-	d	-	ʁ	-	
-	s	t	r	ɛ̃	n	d	-	-	-	
-	s	t	r	ɛ	n	ʤ	iː	-	-	
-	s	t	r	i	n	ʤ	e	r	e	

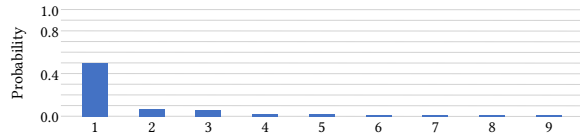
0.0124 (0.0981)										
-	s	t	r	i	n	g	e	r	e	
-	s	t	r	ɨ	n	ʤ	-	-	e	
ɨ	ʃ	t	r	-	ĩ	ʒ	i	ɾ	-	
e	s	t	ɾ	e	ɲ	-	i	ɾ	-	
ə	s	t	ɾ	ɛ	ɲ	-	ə	-	-	
e	-	t	ʁ	ɛ̃	-	-	d	ʁ	-	
-	s	t	r	ɛ̃	n	-	d	-	-	
-	s	t	r	ɛ	n	ʤ	iː	-	-	
-	s	t	r	i	n	ʤ	e	r	e	

0.0110 (0.109)										
-	s	t	r	i	n	g	e	r	e	
-	s	t	r	ɨ	n	ʤ	e	-	-	
ɨ	ʃ	t	r	-	ĩ	ʒ	i	ɾ	-	
e	s	t	ɾ	e	ɲ	-	i	ɾ	-	
ə	s	t	ɾ	ɛ	ɲ	ə	-	-	-	
-	e	t	ʁ	ɛ̃	-	d	-	ʁ	-	
-	s	t	r	ɛ̃	n	d	-	-	-	
-	s	t	r	ɛ	n	ʤ	iː	-	-	
-	s	t	r	i	n	ʤ	e	r	e	

0.00926 (0.118)										
-	s	t	r	i	n	g	e	r	e	
-	s	t	r	ɨ	n	ʤ	e	-	-	
ɨ	ʃ	t	r	-	ĩ	ʒ	i	ɾ	-	
e	s	t	ɾ	e	ɲ	-	i	ɾ	-	
ə	s	t	ɾ	ɛ	ɲ	-	ə	-	-	
-	e	t	ʁ	ɛ̃	-	-	d	ʁ	-	
-	s	t	r	ɛ̃	n	-	d	-	-	
-	s	t	r	ɛ	n	ʤ	iː	-	-	
-	s	t	r	i	n	ʤ	e	r	e	

0.00914 (0.128)										
-	s	t	r	i	n	g	-	e	r	e
-	s	t	r	ɨ	n	ʤ	-	-	-	e
ɨ	ʃ	t	r	-	ĩ	ʒ	-	i	ɾ	-
e	s	t	ɾ	e	ɲ	-	-	i	ɾ	-
ə	s	t	ɾ	ɛ	ɲ	-	-	ə	-	-
-	e	t	ʁ	ɛ̃	-	d	ʁ	-	-	-
-	s	t	r	ɛ̃	n	d	-	-	-	-
-	s	t	r	ɛ	n	ʤ	-	iː	-	-
-	s	t	r	i	n	ʤ	-	e	r	e

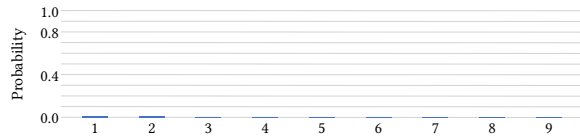
ToStand



	0.501	0.0705 (0.572)	0.0581 (0.630)	0.0240 (0.654)	0.0189 (0.673)
Latin	l e v aː r e	l e v aː r e	l e v aː r e	l e v aː r e	l e v aː r e -
Romanian	l u - a - -	l - - u - a	l u - - - a	l u - a - -	l u - a - - -
Portuguese	l ɨ v a ɾ -	l ɨ v a ɾ -	l ɨ v a ɾ -	l ɨ v a ɾ -	l ɨ v a - - ɾ
Spanish	ʝ e b a ɾ -	ʝ e b a ɾ -	ʝ e b a ɾ -	ʝ e b a ɾ -	ʝ e b a - - ɾ
Catalan	ʎ ə b a - -	ʎ ə b a - -	ʎ ə b a - -	ʎ ə b a - -	ʎ ə b a - - -
French	l ə v e - -	l ə v e - -	l ə v e - -	l ə v e - -	l ə v e - - -
Walloon	l ɛ v e - -	l ɛ v e - -	l ɛ v e - -	l ɛ v e - -	l ɛ v e - - -
Friulian	l e v aː - -	l e v aː - -	l e v aː - -	l e v - aː -	l e v aː - - -
Italian	l e v a r e	l e v a r e	l e v a r e	l e v a r e	l e v a r e -

0.0176 (0.690)	0.0143 (0.705)	0.0133 (0.718)	0.0131 (0.731)
l e v aː r e	l - e v aː r e	l e v aː - r e	l e v aː r - e
l - u a - -	l - u - a - -	l u - a - - -	l u - a - - -
l ɨ v a ɾ -	l - ɨ v a ɾ -	l ɨ v a ɾ - -	l ɨ v a - ɾ -
ʝ e b a ɾ -	- ʝ e b a ɾ -	ʝ e b a ɾ - -	ʝ e b a - ɾ -
ʎ ə b a - -	ʎ - ə b a - -	ʎ ə b a - - -	ʎ ə b a - - -
l ə v e - -	l - ə v e - -	l ə v e - - -	l ə v e - - -
l ɛ v e - -	l - ɛ v e - -	l ɛ v e - - -	l ɛ v e - - -
l e v aː - -	l - e v aː - -	l e v aː - - -	l e v aː - - -
l e v a r e	l - e v a r e	l e v a - r e	l e v a r - e

ToSwell



	0.0133	0.0116 (0.0249)	0.00911 (0.0340)
Latin	k r - eː s k e r e	k r - eː s k e r e	k r eː s k e - r e
Romanian	k r - e ʃ t - - e	k r - e ʃ t - - e	k r e ʃ t - - - e
Portuguese	k ɾ - ɨ ʃ s e ɾ -	k ɾ - ɨ ʃ s e ɾ -	k ɾ ɨ ʃ s e - ɾ -
Spanish	k ɾ - e θ - e ɾ -	k ɾ - e - θ e ɾ -	k ɾ e θ - e - ɾ -
Catalan	k ɾ - e ʃ - ə - -	k ɾ - e ʃ - ə - -	k ɾ e ʃ - ə - - -
French	k ʁ w a t - ʁ - -	k ʁ w a t - - ʁ -	k ʁ w - - a t ʁ -
Walloon	k r - ɛ h - - - -	k r - ɛ h - - - -	k r - - - ɛ - h -
Friulian	k r - ɛ - s i - -	k r - ɛ - s i - -	k r ɛ - s i - - -
Italian	k r - e ʃ ʃ e r e	k r - e ʃ ʃ e r e	k r e ʃ ʃ e - r e

0.00891 (0.0429)	0.00880 (0.0517)	0.00834 (0.0601)
k r - eː s k e r e	k r - eː s k e r e	k r - eː s k e r e
k r - e ʃ t - - e	k r - e ʃ t e - -	k r - e ʃ t - - e
k ɾ - ɨ ʃ s e ɾ -	k ɾ - ɨ ʃ s e ɾ -	k ɾ - ɨ ʃ s e ɾ -
k ɾ - e θ - e ɾ -	k ɾ - e θ - e ɾ -	k ɾ - e θ - e ɾ -
k ɾ - e ʃ - - ə -	k ɾ - e ʃ - ə - -	k ɾ - e ʃ - ə - -
k ʁ w a t - - ʁ -	k ʁ w a t - - ʁ -	k ʁ w a t - - ʁ -
k r - ɛ h - - - -	k r - ɛ h - - - -	k r - ɛ h - - - -
k r - ɛ - s i - -	k r - ɛ - s i - -	k r - ɛ - s i - -
k r - e ʃ ʃ e r e	k r - e ʃ ʃ e r e	k r - e ʃ ʃ e r e

0.00763 (0.0677)

k	r	eː	s	-	k	e	r	-	e	-
k	r	e	ʃ	-	t	e	-	-	-	-
k	ɾ	ɨ	ʃ	-	s	-	-	-	e	ɾ
k	ɾ	e	-	-	θ	-	-	-	e	ɾ
k	ɾ	e	-	-	ʃ	-	-	-	ə	-
k	ʁ	w	-	a	t	-	-	ʁ	-	-
k	r	ɛ	-	-	h	-	-	-	-	-
k	r	ɛ	-	-	s	-	-	-	i	-
k	r	e	ʃ	-	ʃ	e	r	-	e	-

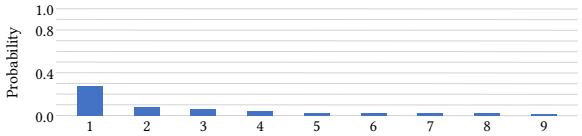
0.00634 (0.0741)

k	r	eː	s	k	e	-	r	e	
k	r	e	ʃ	t	-	-	-	e	
k	ɾ	ɨ	ʃ	s	e	-	ɾ	-	
k	ɾ	e	-	θ	e	-	ɾ	-	
k	ɾ	e	ʃ	-	ə	-	-	-	
k	ʁ	w	-	-	a	t	ʁ	-	
k	r	-	-	-	ɛ	h	-	-	
k	r	ɛ	-	s	i	-	-	-	
k	r	e	ʃ	ʃ	e	-	r	e	

0.00609 (0.0801)

k	r	-	eː	s	k	e	r	e	-
k	r	-	e	ʃ	t	e	-	-	-
k	ɾ	-	ɨ	ʃ	s	-	-	e	ɾ
k	ɾ	-	e	θ	-	-	-	e	ɾ
k	ɾ	-	e	ʃ	-	-	-	ə	-
k	ʁ	w	a	t	-	-	-	ʁ	-
k	r	-	ɛ	h	-	-	-	-	-
k	r	-	ɛ	-	s	-	-	i	-
k	r	-	e	ʃ	ʃ	e	r	e	-

ToSwell



0.272

Latin	i	n	f	l	aː	r	e
Romanian	u	m	f	l	a	-	-
Portuguese	-	ĩ	ʃ	-	a	ɾ	-
Spanish	i	n	ʧ	-	a	ɾ	-
Catalan	i	m	f	l	a	-	-
French	-	ɑ̃	f	l	e	-	-
Walloon	-	ẽ	f	l	e	-	-
Friulian	e	n	f	l	aː	-	-
Italian	e	n	f	i	a	r	e

0.0825 (0.355)

Latin	i	n	f	-	l	aː	r	e
Romanian	u	m	f	-	l	a	-	-
Portuguese	-	ĩ	ʃ	-	-	a	ɾ	-
Spanish	i	n	ʧ	-	-	a	ɾ	-
Catalan	i	m	f	-	l	a	-	-
French	-	ɑ̃	f	-	l	e	-	-
Walloon	-	ẽ	f	-	l	e	-	-
Friulian	e	n	f	-	l	aː	-	-
Italian	e	n	f	i	-	a	r	e

0.0641 (0.419)

Latin	i	n	f	l	-	aː	r	e
Romanian	u	m	f	l	-	a	-	-
Portuguese	-	ĩ	ʃ	-	-	a	ɾ	-
Spanish	i	n	ʧ	-	-	a	ɾ	-
Catalan	i	m	f	l	-	a	-	-
French	-	ɑ̃	f	l	-	e	-	-
Walloon	-	ẽ	f	l	-	e	-	-
Friulian	e	n	f	l	-	aː	-	-
Italian	e	n	f	-	i	a	r	e

0.0435 (0.462)

Latin	i	n	f	l	aː	r	e
Romanian	u	m	f	l	-	-	a
Portuguese	-	ĩ	ʃ	-	a	ɾ	-
Spanish	i	n	ʧ	-	a	ɾ	-
Catalan	i	m	f	l	a	-	-
French	-	ɑ̃	f	l	e	-	-
Walloon	-	ẽ	f	l	e	-	-
Friulian	e	n	f	l	aː	-	-
Italian	e	n	f	i	a	r	e

0.0268 (0.489)

Latin	i	n	f	l	-	aː	r	e
Romanian	u	m	f	-	-	-	l	a
Portuguese	-	ĩ	ʃ	-	-	a	ɾ	-
Spanish	i	n	ʧ	-	-	a	ɾ	-
Catalan	i	m	f	-	-	-	l	a
French	-	ɑ̃	f	-	-	-	l	e
Walloon	-	ẽ	f	-	-	-	l	e
Friulian	e	n	f	-	-	-	l	aː
Italian	e	n	f	-	i	a	r	e

0.0226 (0.512)

Latin	i	n	f	-	l	aː	r	e
Romanian	u	m	f	-	-	-	l	a
Portuguese	-	ĩ	ʃ	-	-	a	ɾ	-
Spanish	i	n	ʧ	-	-	a	ɾ	-
Catalan	i	m	f	-	-	-	l	a
French	-	ɑ̃	f	-	-	-	l	e
Walloon	-	ẽ	f	-	-	-	l	e
Friulian	e	n	f	-	-	-	l	aː
Italian	e	n	f	i	-	a	r	e

0.0217 (0.533)

Latin	i	n	f	l	aː	r	e
Romanian	u	m	f	l	a	-	-
Portuguese	ĩ	-	ʃ	-	a	ɾ	-
Spanish	i	n	ʧ	-	a	ɾ	-
Catalan	i	m	f	l	a	-	-
French	-	ɑ̃	f	l	e	-	-
Walloon	-	ẽ	f	l	e	-	-
Friulian	e	n	f	l	aː	-	-
Italian	e	n	f	i	a	r	e

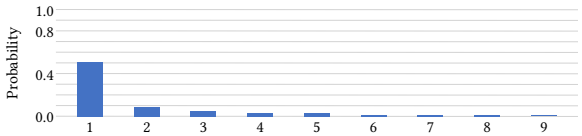
0.0190 (0.552)

Latin	i	n	f	l	aː	r	e
Romanian	u	m	f	l	a	-	-
Portuguese	-	ĩ	ʃ	-	a	ɾ	-
Spanish	i	n	ʧ	-	a	ɾ	-
Catalan	i	m	f	l	a	-	-
French	ɑ̃	-	f	l	e	-	-
Walloon	ẽ	-	f	l	e	-	-
Friulian	e	n	f	l	aː	-	-
Italian	e	n	f	i	a	r	e

0.0171 (0.570)

Latin	i	n	f	l	aː	r	e
Romanian	u	m	f	l	a	-	-
Portuguese	-	ĩ	-	ʃ	a	ɾ	-
Spanish	i	n	-	ʧ	a	ɾ	-
Catalan	i	m	f	l	a	-	-
French	-	ɑ̃	f	l	e	-	-
Walloon	-	ẽ	f	l	e	-	-
Friulian	e	n	f	l	aː	-	-
Italian	e	n	f	i	a	r	e

ToThink



	0.512						
Latin	p	e	n	s	aː	r	e
Romanian	p	ə	-	s	a	-	-
Portuguese	p	-	ẽ	s	a	ɾ	-
Spanish	p	e	n	s	a	ɾ	-
Catalan	p	ə	n	s	a	-	-
French	p	-	ɑ̃	s	e	-	-
Walloon	p	-	ɛ̃	s	e	-	-
Friulian	p	e	n	s	aː	-	-
Italian	p	e	n	s	a	r	e

	0.0856 (0.597)						
Latin	p	e	n	s	aː	r	e
Romanian	p	ə	-	s	-	-	a
Portuguese	p	-	ẽ	s	a	ɾ	-
Spanish	p	e	n	s	a	ɾ	-
Catalan	p	ə	n	s	a	-	-
French	p	-	ɑ̃	s	e	-	-
Walloon	p	-	ɛ̃	s	e	-	-
Friulian	p	e	n	s	aː	-	-
Italian	p	e	n	s	a	r	e

	0.0503 (0.648)						
Latin	p	e	n	s	aː	r	e
Romanian	p	ə	-	s	a	-	-
Portuguese	p	ẽ	-	s	a	ɾ	-
Spanish	p	e	n	s	a	ɾ	-
Catalan	p	ə	n	s	a	-	-
French	p	-	ɑ̃	s	e	-	-
Walloon	p	-	ɛ̃	s	e	-	-
Friulian	p	e	n	s	aː	-	-
Italian	p	e	n	s	a	r	e

	0.0365 (0.684)						
Latin	p	e	n	s	aː	r	e
Romanian	p	ə	-	s	a	-	-
Portuguese	p	-	ẽ	s	a	ɾ	-
Spanish	p	e	n	s	a	ɾ	-
Catalan	p	ə	n	s	a	-	-
French	p	ɑ̃	-	s	e	-	-
Walloon	p	ɛ̃	-	s	e	-	-
Friulian	p	e	n	s	aː	-	-
Italian	p	e	n	s	a	r	e

	0.0282 (0.712)						
Latin	p	e	n	s	aː	r	e
Romanian	p	ə	-	s	a	-	-
Portuguese	p	-	ẽ	s	a	ɾ	-
Spanish	p	e	n	s	a	ɾ	-
Catalan	p	ə	n	s	a	-	-
French	p	-	ɑ̃	s	e	-	-
Walloon	p	-	ɛ̃	s	e	-	-
Friulian	p	e	n	s	-	aː	-
Italian	p	e	n	s	a	r	e

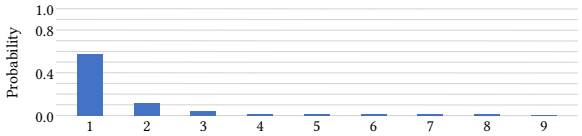
	0.0137 (0.726)							
Latin	p	e	n	s	aː	r	e	-
Romanian	p	ə	-	s	a	-	-	-
Portuguese	p	-	ẽ	s	a	-	-	ɾ
Spanish	p	e	n	s	a	-	-	ɾ
Catalan	p	ə	n	s	a	-	-	-
French	p	-	ɑ̃	s	e	-	-	-
Walloon	p	-	ɛ̃	s	e	-	-	-
Friulian	p	e	n	s	aː	-	-	-
Italian	p	e	n	s	a	r	e	-

	0.0115 (0.738)							
Latin	p	e	n	s	aː	r	-	e
Romanian	p	ə	-	s	a	-	-	-
Portuguese	p	-	ẽ	s	a	-	ɾ	-
Spanish	p	e	n	s	a	-	ɾ	-
Catalan	p	ə	n	s	a	-	-	-
French	p	-	ɑ̃	s	e	-	-	-
Walloon	p	-	ɛ̃	s	e	-	-	-
Friulian	p	e	n	s	aː	-	-	-
Italian	p	e	n	s	a	r	-	e

	0.00940 (0.747)							
Latin	p	e	n	s	aː	-	r	e
Romanian	p	ə	-	s	-	a	-	-
Portuguese	p	-	ẽ	s	-	a	ɾ	-
Spanish	p	e	n	s	-	a	ɾ	-
Catalan	p	ə	n	s	-	a	-	-
French	p	-	ɑ̃	s	-	e	-	-
Walloon	p	-	ɛ̃	s	-	e	-	-
Friulian	p	e	n	s	-	aː	-	-
Italian	p	e	n	s	-	a	r	e

	0.00934 (0.756)						
Latin	p	e	n	s	aː	r	e
Romanian	p	-	ə	s	a	-	-
Portuguese	p	-	ẽ	s	a	ɾ	-
Spanish	p	e	n	s	a	ɾ	-
Catalan	p	ə	n	s	a	-	-
French	p	-	ɑ̃	s	e	-	-
Walloon	p	-	ɛ̃	s	e	-	-
Friulian	p	e	n	s	aː	-	-
Italian	p	e	n	s	a	r	e

ToTurnIntransitive



	0.579						
Latin	t	o	r	n	aː	r	e
Romanian	t	u	r	n	a	-	-
Portuguese	t	u	ɾ	n	a	ɾ	-
Spanish	t	o	ɾ	n	a	ɾ	-
Catalan	t	u	r	n	a	-	-
French	t	u	ʁ	n	e	-	-
Walloon	t	u	r	n	e	-	-
Friulian	t	o	r	n	aː	-	-
Italian	t	o	r	n	a	r	e

	0.115 (0.693)						
Latin	t	o	r	n	aː	r	e
Romanian	t	u	r	n	-	-	a
Portuguese	t	u	ɾ	n	a	ɾ	-
Spanish	t	o	ɾ	n	a	ɾ	-
Catalan	t	u	r	n	a	-	-
French	t	u	ʁ	n	e	-	-
Walloon	t	u	r	n	e	-	-
Friulian	t	o	r	n	aː	-	-
Italian	t	o	r	n	a	r	e

	0.0397 (0.733)						
Latin	t	o	r	n	aː	r	e
Romanian	t	u	r	n	a	-	-
Portuguese	t	u	ɾ	n	a	ɾ	-
Spanish	t	o	ɾ	n	a	ɾ	-
Catalan	t	u	r	n	a	-	-
French	t	u	ʁ	n	e	-	-
Walloon	t	u	r	n	e	-	-
Friulian	t	o	r	n	-	aː	-
Italian	t	o	r	n	a	r	e

	0.0158 (0.749)							
Latin	t	o	r	n	aː	r	e	-
Romanian	t	u	r	n	a	-	-	-
Portuguese	t	u	ɾ	n	a	-	-	ɾ
Spanish	t	o	ɾ	n	a	-	-	ɾ
Catalan	t	u	r	n	a	-	-	-
French	t	u	ʁ	n	e	-	-	-
Walloon	t	u	r	n	e	-	-	-
Friulian	t	o	r	n	aː	-	-	-
Italian	t	o	r	n	a	r	e	-

0.0119 (0.760)

t	o	r	n	aː	r	-	e
t	u	r	n	a	-	-	-
t	u	ɾ	n	a	-	ɾ	-
t	o	ɾ	n	a	-	ɾ	-
t	u	r	n	a	-	-	-
t	u	ʁ	n	e	-	-	-
t	u	r	n	e	-	-	-
t	o	r	n	aː	-	-	-
t	o	r	n	a	r	-	e

0.0118 (0.772)

t	o	r	n	-	aː	r	e
t	u	r	n	a	-	-	-
t	u	ɾ	n	a	-	ɾ	-
t	o	ɾ	n	a	-	ɾ	-
t	u	r	n	a	-	-	-
t	u	ʁ	n	e	-	-	-
t	u	r	n	e	-	-	-
t	o	r	n	aː	-	-	-
t	o	r	n	a	-	r	e

0.0110 (0.783)

t	o	r	n	aː	r	e	-
t	u	r	n	a	-	-	-
t	u	ɾ	n	a	ɾ	-	-
t	o	ɾ	n	a	ɾ	-	-
t	u	r	n	a	-	-	-
t	u	ʁ	n	e	-	-	-
t	u	r	n	e	-	-	-
t	o	r	n	aː	-	-	-
t	o	r	n	a	r	-	e

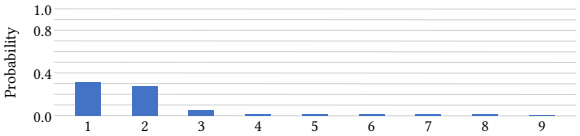
0.0101 (0.793)

t	o	r	n	aː	-	r	e
t	u	r	n	-	a	-	-
t	u	ɾ	n	-	a	ɾ	-
t	o	ɾ	n	-	a	ɾ	-
t	u	r	n	-	a	-	-
t	u	ʁ	n	-	e	-	-
t	u	r	n	-	e	-	-
t	o	r	n	-	aː	-	-
t	o	r	n	-	a	r	e

0.00929 (0.803)

t	o	r	n	aː	-	r	e
t	u	r	n	a	-	-	-
t	u	ɾ	n	a	ɾ	-	-
t	o	ɾ	n	a	ɾ	-	-
t	u	r	n	a	-	-	-
t	u	ʁ	n	e	-	-	-
t	u	r	n	e	-	-	-
t	o	r	n	aː	-	-	-
t	o	r	n	a	-	r	e

ToWash



0.313

Latin	l	a	w	aː	r	e
Romanian	l	a	-	-	-	-
Portuguese	l	ɐ	v	a	ɾ	-
Spanish	l	a	b	a	ɾ	-
Catalan	ʎ	ə	b	a	-	-
French	l	a	v	e	-	-
Walloon	l	a	v	e	-	-
Friulian	l	a	v	aː	-	-
Italian	l	a	v	a	r	e

0.281 (0.594)

Latin	l	a	w	aː	r	e
Romanian	l	-	-	a	-	-
Portuguese	l	ɐ	v	a	ɾ	-
Spanish	l	a	b	a	ɾ	-
Catalan	ʎ	ə	b	a	-	-
French	l	a	v	e	-	-
Walloon	l	a	v	e	-	-
Friulian	l	a	v	aː	-	-
Italian	l	a	v	a	r	e

0.0511 (0.645)

Latin	l	a	w	aː	r	e
Romanian	l	-	-	-	-	a
Portuguese	l	ɐ	v	a	ɾ	-
Spanish	l	a	b	a	ɾ	-
Catalan	ʎ	ə	b	a	-	-
French	l	a	v	e	-	-
Walloon	l	a	v	e	-	-
Friulian	l	a	v	aː	-	-
Italian	l	a	v	a	r	e

0.0162 (0.661)

Latin	l	a	w	-	aː	r	e
Romanian	l	a	-	-	-	-	-
Portuguese	l	ɐ	-	v	a	ɾ	-
Spanish	l	a	-	b	a	ɾ	-
Catalan	ʎ	ə	-	b	a	-	-
French	l	a	-	v	e	-	-
Walloon	l	a	-	v	e	-	-
Friulian	l	a	-	v	aː	-	-
Italian	l	a	-	v	a	r	e

0.0137 (0.675)

Latin	l	a	w	aː	r	e
Romanian	l	a	-	-	-	-
Portuguese	l	ɐ	v	a	ɾ	-
Spanish	l	a	b	a	ɾ	-
Catalan	ʎ	ə	b	a	-	-
French	l	a	v	e	-	-
Walloon	l	a	v	e	-	-
Friulian	l	a	v	-	aː	-
Italian	l	a	v	a	r	e

0.0117 (0.686)

Latin	l	a	-	w	aː	r	e
Romanian	l	-	-	-	a	-	-
Portuguese	l	ɐ	v	-	a	ɾ	-
Spanish	l	a	b	-	a	ɾ	-
Catalan	ʎ	ə	b	-	a	-	-
French	l	a	v	-	e	-	-
Walloon	l	a	v	-	e	-	-
Friulian	l	a	v	-	aː	-	-
Italian	l	a	v	-	a	r	e

0.0114 (0.698)

Latin	l	a	-	w	aː	r	e
Romanian	l	a	-	-	-	-	-
Portuguese	l	ɐ	v	-	a	ɾ	-
Spanish	l	a	b	-	a	ɾ	-
Catalan	ʎ	ə	b	-	a	-	-
French	l	a	v	-	e	-	-
Walloon	l	a	v	-	e	-	-
Friulian	l	a	v	-	aː	-	-
Italian	l	a	v	-	a	r	e

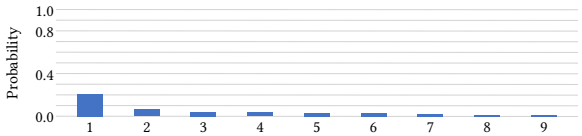
0.0102 (0.708)

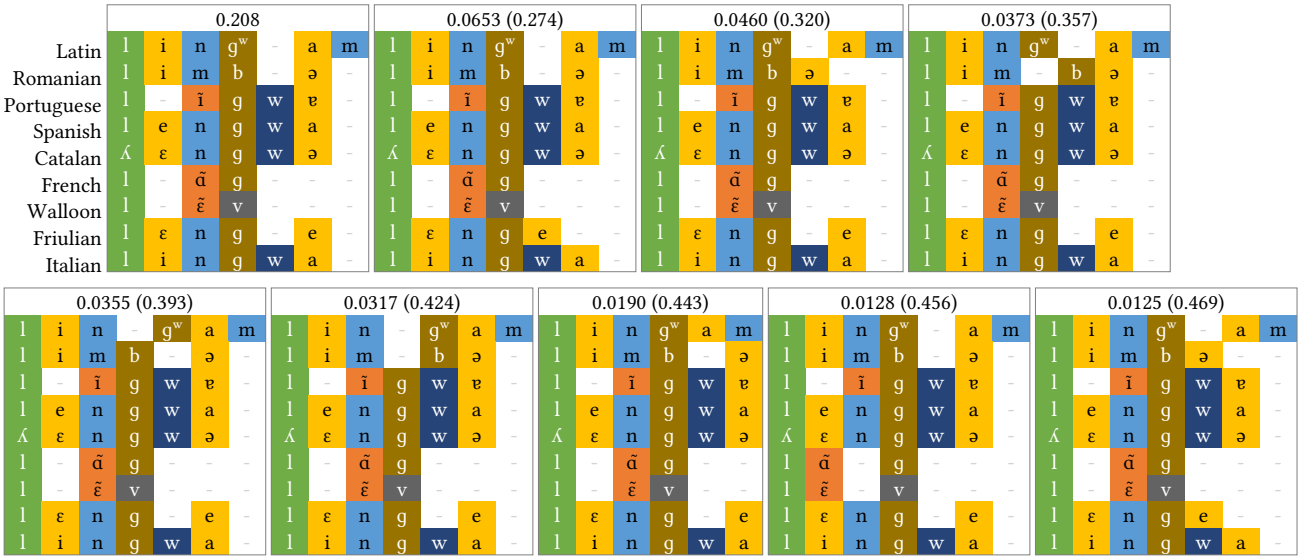
Latin	l	a	w	aː	r	e
Romanian	l	-	-	a	-	-
Portuguese	l	ɐ	v	a	ɾ	-
Spanish	l	a	b	a	ɾ	-
Catalan	ʎ	ə	b	a	-	-
French	l	a	v	e	-	-
Walloon	l	a	v	e	-	-
Friulian	l	a	v	-	aː	-
Italian	l	a	v	a	r	e

0.00837 (0.716)

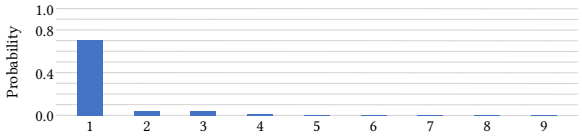
Latin	l	a	w	aː	r	e	-
Romanian	l	-	-	a	-	-	-
Portuguese	l	ɐ	v	a	-	-	ɾ
Spanish	l	a	b	a	-	-	ɾ
Catalan	ʎ	ə	b	a	-	-	-
French	l	a	v	e	-	-	-
Walloon	l	a	v	e	-	-	-
Friulian	l	a	v	aː	-	-	-
Italian	l	a	v	a	r	e	-

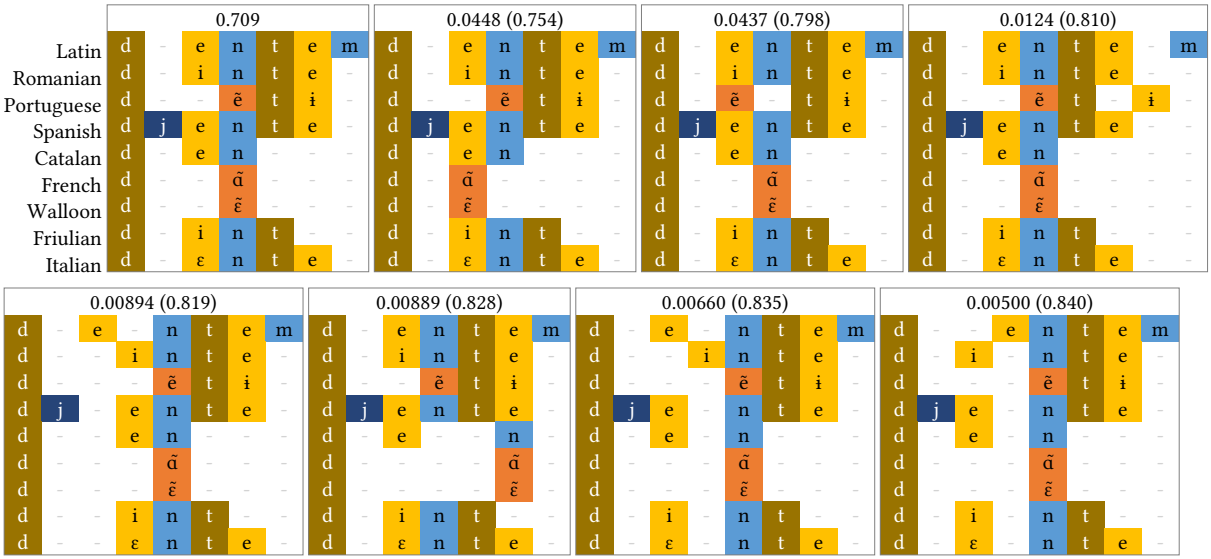
Tongue





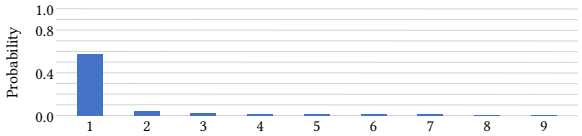
Tooth





0.00491 (0.845)						
d	-	e	n	t	e	m
d	-	i	n	t	e	-
d	ẽ	-	-	t	ɨ	-
d	j	e	n	t	e	-
d	-	e	n	-	-	-
d	-	-	ɑ̃	-	-	-
d	-	-	ɛ̃	-	-	-
d	-	i	n	t	-	-
d	-	ɛ	n	t	e	-

Tree



	0.575						
Latin	a	r	b	o	r	e	m
Romanian	a	r	b	o	r	e	-
Portuguese	a	ɾ	v	u	ɾ	ɨ	-
Spanish	a	ɾ	b	o	l	-	-
Catalan	a	-	b	-	ɾ	ə	-
French	a	ʁ	b	-	ʁ	-	-
Walloon	ɔ	-	p	-	-	-	-
Friulian	a	r	b	u	l	-	-
Italian	a	l	b	e	r	o	-

	0.0457 (0.621)						
Latin	a	r	b	o	r	e	m
Romanian	a	r	b	o	r	e	-
Portuguese	a	ɾ	v	u	ɾ	ɨ	-
Spanish	a	ɾ	b	o	l	-	-
Catalan	a	-	b	-	ɾ	ə	-
French	a	ʁ	b	-	ʁ	-	-
Walloon	ɔ	-	-	-	p	-	-
Friulian	a	r	b	u	l	-	-
Italian	a	l	b	e	r	o	-

	0.0281 (0.649)						
Latin	a	r	b	o	r	e	m
Romanian	a	r	b	o	r	e	-
Portuguese	a	ɾ	v	u	ɾ	ɨ	-
Spanish	a	ɾ	b	o	l	-	-
Catalan	a	-	b	-	ɾ	ə	-
French	a	ʁ	b	-	ʁ	-	-
Walloon	ɔ	p	-	-	-	-	-
Friulian	a	r	b	u	l	-	-
Italian	a	l	b	e	r	o	-

	0.0118 (0.661)						
Latin	a	r	b	o	r	e	m
Romanian	a	r	b	o	r	e	-
Portuguese	a	ɾ	v	u	ɾ	ɨ	-
Spanish	a	ɾ	b	o	l	-	-
Catalan	a	-	b	-	ɾ	ə	-
French	a	ʁ	b	-	ʁ	-	-
Walloon	-	ɔ	p	-	-	-	-
Friulian	a	r	b	u	l	-	-
Italian	a	l	b	e	r	o	-

0.0108 (0.672)							
a	r	b	o	r	e	m	-
a	r	b	o	r	-	-	e
a	ɾ	v	u	ɾ	-	-	ɨ
a	ɾ	b	o	l	-	-	-
a	-	b	-	ɾ	-	-	ə
a	ʁ	b	-	ʁ	-	-	-
ɔ	-	p	-	-	-	-	-
a	r	b	u	l	-	-	-
a	l	b	e	r	-	-	o

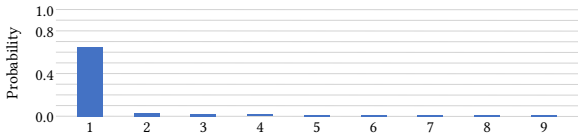
0.0104 (0.682)							
a	r	b	o	r	-	e	m
a	r	b	o	r	e	-	-
a	ɾ	v	u	ɾ	ɨ	-	-
a	ɾ	b	o	l	-	-	-
a	-	b	-	ɾ	ə	-	-
a	ʁ	b	-	ʁ	-	-	-
ɔ	-	p	-	-	-	-	-
a	r	b	u	l	-	-	-
a	l	b	e	r	o	-	-

0.00971 (0.692)							
a	r	b	o	r	e	-	m
a	r	b	o	r	-	e	-
a	ɾ	v	u	ɾ	-	ɨ	-
a	ɾ	b	o	l	-	-	-
a	-	b	-	ɾ	-	ə	-
a	ʁ	b	-	ʁ	-	-	-
ɔ	-	p	-	-	-	-	-
a	r	b	u	l	-	-	-
a	l	b	e	r	-	o	-

0.00906 (0.701)							
a	r	b	o	r	e	m	
a	r	b	o	r	-	e	
a	ɾ	v	u	ɾ	-	ɨ	
a	ɾ	b	o	l	-	-	
a	-	b	-	ɾ	-	ə	
a	ʁ	b	-	ʁ	-	-	
ɔ	-	p	-	-	-	-	
a	r	b	u	l	-	-	
a	l	b	e	r	-	o	

0.00794 (0.709)							
a	r	b	o	-	r	e	m
a	r	b	o	-	r	e	-
a	ɾ	v	u	-	ɾ	ɨ	-
a	ɾ	b	o	-	l	-	-
a	-	b	-	-	ɾ	ə	-
a	ʁ	b	-	-	ʁ	-	-
ɔ	-	-	-	p	-	-	-
a	r	b	u	-	l	-	-
a	l	b	e	-	r	o	-

Warm

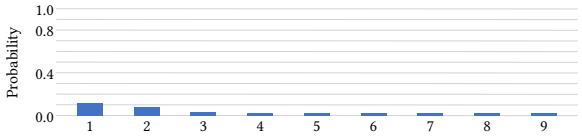


	0.655	0.0349 (0.690)	0.0228 (0.712)	0.0184 (0.731)
Latin	k a l i d u m	k a l i d u m	k a l i d u m	k a l i d u - m
Romanian	k a l - d - -	k a l - d - -	k a l - d - -	k a l - d - - -
Portuguese	k a l - d u -	k a l - d u -	k a l - d u -	k a l - d u - -
Spanish	k a l - d o -	k a l - d o -	k a l - d o -	k a l - d o - -
Catalan	k a l - - - -	k a l - - - -	k a l - - - -	k a l - - - - -
French	ʃ o - - - - -	ʃ o - - - - -	ʃ - - - o -	ʃ o - - - - -
Walloon	ʧ o - - - - -	ʧ o - - - - -	ʧ - - - o -	ʧ o - - - - -
Friulian	c a l - t - -	c a l - - t -	c a l - t - -	c a l - - - t -
Italian	k a l - d o -	k a l - d o -	k a l - d o -	k a l - d o - -

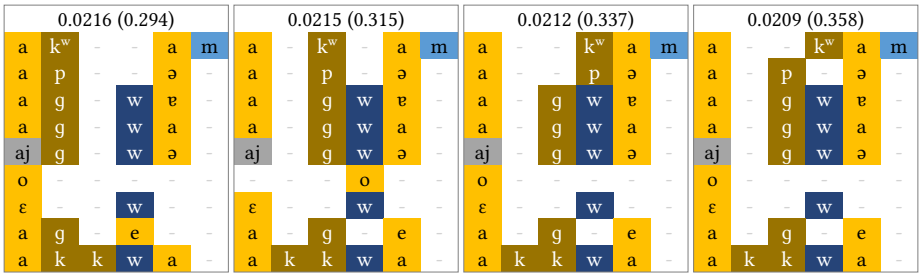
	0.0169 (0.748)	0.0161 (0.764)	0.0139 (0.778)	0.0135 (0.791)
Latin	k a l i d u - m	k a l i d - u m	k a l i d u m -	k a l i - d u m
Romanian	k a l - d - - -	k a l - d - - -	k a l - d - - -	k a l - - d - -
Portuguese	k a l - d - u -	k a l - d - u -	k a l - d - - u	k a l - - d u -
Spanish	k a l - d - o -	k a l - d - o -	k a l - d - - o	k a l - - d o -
Catalan	k a l - - - - -	k a l - - - - -	k a l - - - - -	k a l - - - - -
French	ʃ o - - - - - -	ʃ o - - - - - -	ʃ o - - - - - -	ʃ o - - - - - -
Walloon	ʧ o - - - - - -	ʧ o - - - - - -	ʧ o - - - - - -	ʧ o - - - - - -
Friulian	c a l - t - - -	c a l - - t - -	c a l - t - - -	c a l - t - - -
Italian	k a l - d - o -	k a l - d - o -	k a l - d - - o	k a l - - d o -

	0.0113 (0.802)
Latin	k a l i d u m -
Romanian	k a l - d - - -
Portuguese	k a l - d u - -
Spanish	k a l - d o - -
Catalan	k a l - - - - -
French	ʃ o - - - - - -
Walloon	ʧ o - - - - - -
Friulian	c a l - - - - t
Italian	k a l - d o - -

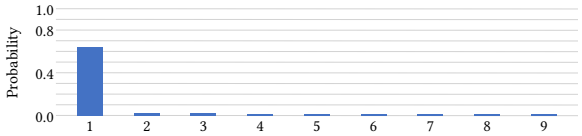
Water

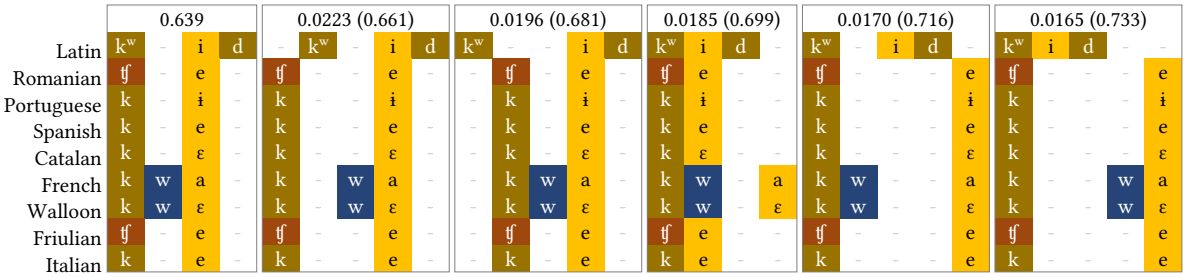


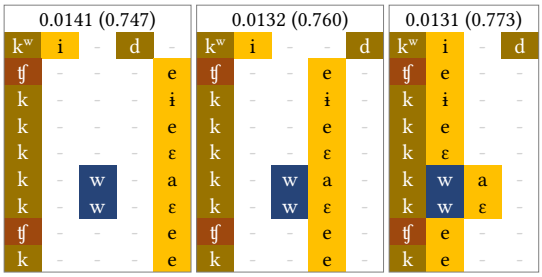
	0.119	0.0755 (0.194)	0.0297 (0.224)	0.0254 (0.250)	0.0227 (0.272)
Latin	a - kʷ - a m	a kʷ - - a m	a - kʷ - a m	a - - kʷ a m	a - kʷ - a m
Romanian	a - p - ə -	a p - - ə -	a - p - ə -	a - - p ə -	a - - p ə -
Portuguese	a - g w ɐ -	a g - w ɐ -	a - g w ɐ -	a g - w ɐ -	a - g w ɐ -
Spanish	a - g w a -	a g - w a -	a - g w a -	a g - w a -	a - g w a -
Catalan	aj - g w ə -	aj g - w ə -	aj - g w ə -	aj g - w ə -	aj - g w ə -
French	o - - - - -	o - - - - -	o - - - - -	o - - - - -	o - - - - -
Walloon	ɛ - - w - -	ɛ - - w - -	ɛ - - w - -	ɛ - - w - -	ɛ - - w - -
Friulian	a - g - e -	a g - - e -	a - g e - -	a g - - e -	a - g - e -
Italian	a k k w a -	a k k w a -	a k k w a -	a k k w a -	a k k w a -


0.0216 (0.294)
0.0215 (0.315)
0.0212 (0.337)
0.0209 (0.358)

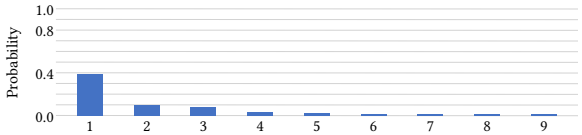
What

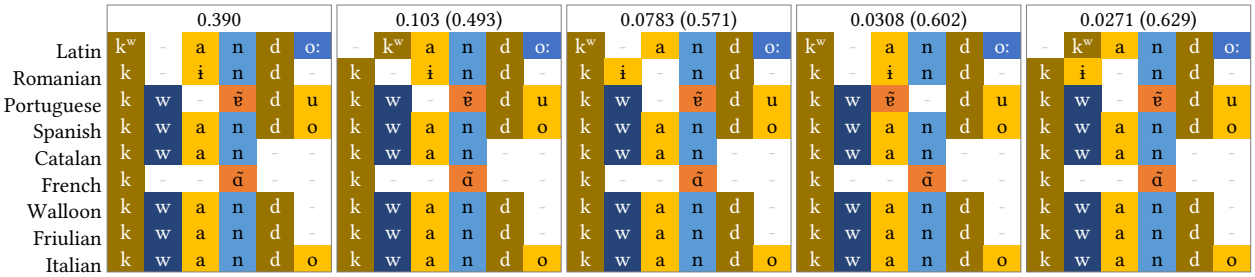

Probability
1.0
0.8
0.4
0.0
1
2
3
4
5
6
7
8
9

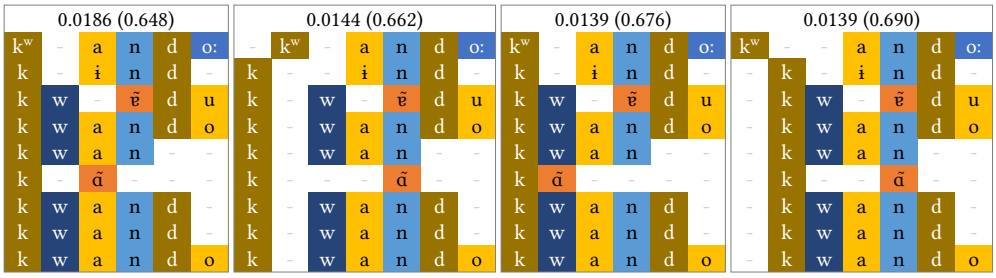

Latin
Romanian
Portuguese
Spanish
Catalan
French
Walloon
Friulian
Italian
0.639
0.0223 (0.661)
0.0196 (0.681)
0.0185 (0.699)
0.0170 (0.716)
0.0165 (0.733)


0.0141 (0.747)
0.0132 (0.760)
0.0131 (0.773)

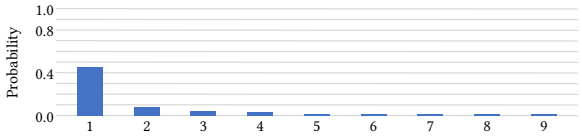
When

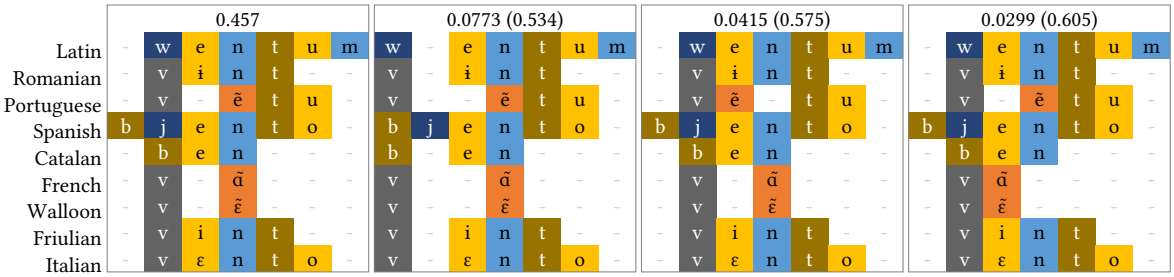

Probability
1.0
0.8
0.4
0.0
1
2
3
4
5
6
7
8
9

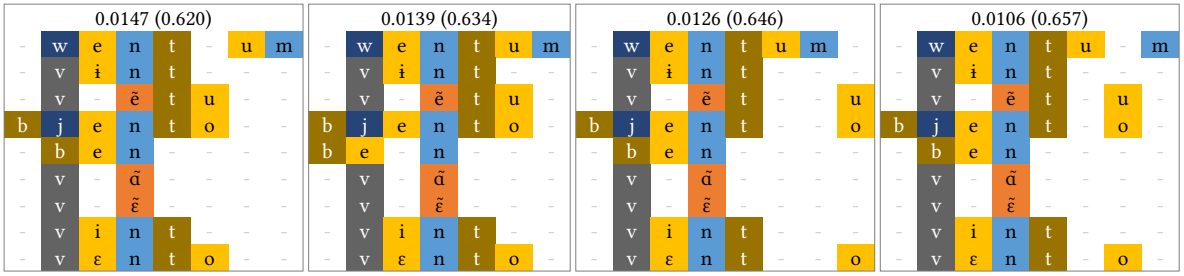

Latin
Romanian
Portuguese
Spanish
Catalan
French
Walloon
Friulian
Italian
0.390
0.103 (0.493)
0.0783 (0.571)
0.0308 (0.602)
0.0271 (0.629)

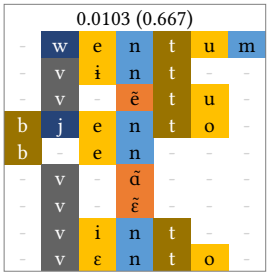

0.0186 (0.648)
0.0144 (0.662)
0.0139 (0.676)
0.0139 (0.690)

Wind

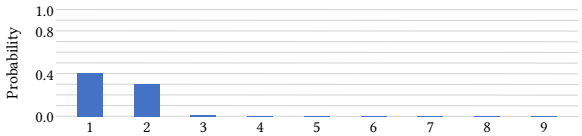

Probability
1.0
0.8
0.4
0.0
1
2
3
4
5
6
7
8
9


Latin
Romanian
Portuguese
Spanish
Catalan
French
Walloon
Friulian
Italian
0.457
0.0773 (0.534)
0.0415 (0.575)
0.0299 (0.605)


0.0147 (0.620)
0.0139 (0.634)
0.0126 (0.646)
0.0106 (0.657)


0.0103 (0.667)

Woman

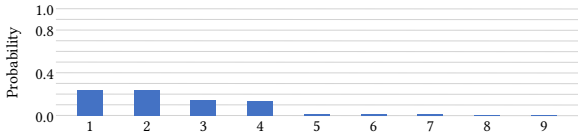


	0.410	0.305 (0.714)	0.00980 (0.724)	0.00677 (0.731)
Latin	d o m i n a m	d o m i n a m	d o m i n a m	d o - m i n a m
Romanian	d ǫa m - n ə -	d ǫa m - n ə -	d ǫa m - n ə -	d ǫa - m - n ə -
Portuguese	d o - - n ɐ -	d o n - - ɐ -	d o - - n ɐ -	d o - - - n ɐ -
Spanish	d o - - ɲ a -	d o ɲ - - a -	d o - - ɲ a -	d o - - - ɲ a -
Catalan	d ɔ - - n ə -	d ɔ n - - ə -	d ɔ - - n ə -	d ɔ - - - n ə -
French	d a - - m - -	d a m - - - -	d a - - - m -	d a - - - m - -
Walloon	d a - - m - -	d a m - - - -	d a - - - m -	d a - - - m - -
Friulian	d ɔ - - n e -	d ɔ n - - e -	d ɔ - - n e -	d ɔ - - - n e -
Italian	d ɔ n - n a -	d ɔ n - n a -	d ɔ n - n a -	d ɔ n - - n a -

	0.00669 (0.738)	0.00643 (0.744)	0.00640 (0.751)	0.00609 (0.757)
Latin	d o m - i n a m	d o m i n a m -	d o m i n a m	d o - m i n a m
Romanian	d ǫa m - - n ə -	d ǫa m - n ə - -	d ǫa - m n ə -	d - ǫa m - n ə -
Portuguese	d o - - - n ɐ -	d o - - n ɐ - -	d o - - n ɐ -	d - o - - n ɐ -
Spanish	d o - - - ɲ a -	d o - - ɲ a - -	d o - - ɲ a -	d - o - - ɲ a -
Catalan	d ɔ - - - n ə -	d ɔ - - n - - ə	d ɔ - - n ə -	d - ɔ - - n ə -
French	d a - - - m - -	d a - - m - - -	d a - - m - -	d - a - - m - -
Walloon	d a - - - m - -	d a - - m - - -	d a - - m - -	d - a - - m - -
Friulian	d ɔ - - - n e -	d ɔ - - n e - -	d ɔ - - n e -	d - ɔ - - n e -
Italian	d ɔ - n - n a -	d ɔ n - n a - -	d ɔ - - n n a -	d - ɔ n - n a -

	0.00537 (0.762)
Latin	d o m i n a - m
Romanian	d ǫa m - n - ə -
Portuguese	d o n - - - ɐ -
Spanish	d o ɲ - - - a -
Catalan	d ɔ n - - - ə -
French	d a m - - - - -
Walloon	d a m - - - - -
Friulian	d ɔ n - - - e -
Italian	d ɔ n - n - a -

Year



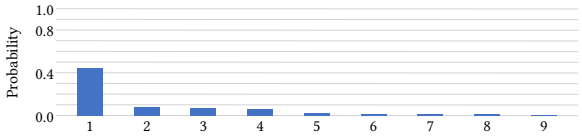
	0.243	0.241 (0.484)	0.148 (0.632)	0.137 (0.769)	0.0169 (0.786)	0.0167 (0.803)
Latin	a n n u m	a n n u m	a n n u m	a n n u m	a n n u m	a n n u m
Romanian	a n - - -	a - n - -	a - n - -	a n - - -	a - n - -	a n - - -
Portuguese	ɐ - n u -	ɐ n - u -	ɐ - n u -	ɐ n - u -	ɐ n - u -	ɐ - n u -
Spanish	a - ɲ o -	a ɲ - o -	a - ɲ o -	a ɲ - o -	a ɲ - o -	a - ɲ o -
Catalan	a - ɲ - -	a ɲ - - -	a - ɲ - -	a ɲ - - -	a ɲ - - -	a - ɲ - -
French	- - ɑ̃ - -	- ɑ̃ - - -	- - ɑ̃ - -	- ɑ̃ - - -	ɑ̃ - - - -	ɑ̃ - - - -
Walloon	- - ɑ̃ - -	- ɑ̃ - - -	- - ɑ̃ - -	- ɑ̃ - - -	ɑ̃ - - - -	ɑ̃ - - - -
Friulian	a - n - -	a n - - -	a - n - -	a n - - -	a n - - -	a - n - -
Italian	a n n o -	a n n o -	a n n o -	a n n o -	a n n o -	a n n o -

0.0111 (0.814)				
a	n	n	u	m
a	-	n	-	-
ɐ	-	n	u	-
a	-	ɲ	o	-
a	-	ɲ	-	-
ɑ̃	-	-	-	-
ɑ̃	-	-	-	-
a	-	n	-	-
a	n	n	o	-

0.00866 (0.822)				
a	n	n	u	m
a	n	-	-	-
ɐ	n	-	u	-
a	ɲ	-	o	-
a	ɲ	-	-	-
ɑ̃	-	-	-	-
ɑ̃	-	-	-	-
a	n	-	-	-
a	n	n	o	-

0.00509 (0.827)					
a	n	n	u	m	-
a	-	n	-	-	-
ɐ	n	-	-	-	u
a	ɲ	-	-	-	o
a	ɲ	-	-	-	-
-	ɑ̃	-	-	-	-
-	ɑ̃	-	-	-	-
a	n	-	-	-	-
a	n	n	-	-	o

YouPlural



	0.446			0.0832 (0.529)			0.0715 (0.601)				0.0654 (0.666)			
Latin	w	oː	s	w	oː	s	w	oː	s	-	w	oː	-	s
Romanian	v	oj	-	v	-	oj	v	oj	-	-	v	oj	-	-
Portuguese	v	ɔ	ʃ	v	ɔ	ʃ	v	ɔ	ʃ	-	v	ɔ	-	ʃ
Spanish	b	o	s	b	o	s	b	o	s	-	b	o	-	s
Catalan	b	u	s	b	u	s	b	u	s	-	b	u	-	s
French	v	u	-	v	u	-	v	u	-	-	v	u	-	-
Walloon	v	o	-	v	o	-	v	o	-	-	v	o	-	-
Friulian	v	oː	-	v	oː	-	v	oː	-	-	v	oː	-	-
Italian	v	o	i	v	o	i	v	o	-	i	v	o	i	-

	0.0266 (0.693)			0.0127 (0.705)				0.0110 (0.716)				0.00940 (0.726)			
Latin	w	oː	s	w	oː	s	-	w	-	oː	s	-	w	oː	s
Romanian	v	oj	-	v	-	-	oj	v	-	oj	-	v	-	oj	-
Portuguese	v	ɔ	ʃ	v	ɔ	ʃ	-	v	-	ɔ	ʃ	v	-	ɔ	ʃ
Spanish	b	o	s	b	o	s	-	b	-	o	s	b	-	o	s
Catalan	b	u	s	b	u	s	-	b	-	u	s	b	-	u	s
French	v	u	-	v	u	-	-	v	-	u	-	v	-	u	-
Walloon	v	o	-	v	o	-	-	v	-	o	-	v	-	o	-
Friulian	v	-	oː	v	oː	-	-	v	-	oː	-	v	-	oː	-
Italian	v	o	i	v	o	-	i	v	o	i	-	v	-	o	i

0.00869 (0.735)			
w	oː	-	s
v	-	oj	-
v	ɔ	-	ʃ
b	o	-	s
b	u	-	s
v	u	-	-
v	o	-	-
v	oː	-	-
v	o	i	-